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The Anne MacKenzie Oration.¹

THE HUMAN FACTOR IN OUR ENVIRONMENT.

By FRANK S. HONE, B.A., M.B., B.S.,

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I DESIRE first of all to express my appreciation of the honour accorded me in being asked by the Trustees of the Anne MacKenzie Oration Fund to deliver this oration, an appreciation deepened by my sense of unfitness adequately to carry out my task. That sense of unfitness has increased as I have prepared for this evening's function. It is difficult in addressing a public gathering such as this, to deal, as laid down in the founder's directions, with any special "means for preventing or diminishing human disease or disability" without being too technical to be interesting to a non-medical audience. It is still more difficult to speak in a more general way and follow on the complete and adequate analysis put forward by Dr. Cumpston when he delivered the first oration last year.

In South Australia our thoughts during the past year have almost necessarily been turning back a hundred years, since in 1829 Edward Gibbon Wakefield published his "Letter from Sydney" and in 1830 Captain Sturt sailed down the River Murray—to which two events the foundation of our State may be directly attributed. And this has naturally caused reflection on the value of human ventures into the unknown, whether in the world of thought or action. In Australia during the twelve months that have passed since this oration was last delivered there have been two outstanding ventures in regard to public health. The first was the visit of Dame Janet Campbell and her report on maternal and child welfare in Australia, which emphasized the growing recognition of the human factor in the causation of disease and mortality. The second was the opening of the School of Public Health and Tropical Medicine, erected and inaugurated under the joint auspices of the Commonwealth Department of Health and the University of Sydney—a public recognition of the importance of the human element in the prevention of disease. For this school makes a new departure in that it not only proposes to train medical experts and practitioners in the principles of preventive medicine, but also members of the general public whose duty or interest may bring them into relation to public health either in our own country or adjoining tropical territories.

Reflection on the significance of these two events revealed the tremendous widening of our outlook on the methods for preventing disease, not merely as contrasted with a century ago, but even with the beginning of our existence as a Commonwealth thirty years ago, more especially in our recognition

of the importance of the human factor. It seemed appropriate this year, therefore, to elaborate this theme and especially in reference to Australian conditions, since at the present juncture anything that makes for greater efficiency in any department of our national life, needs to be emphasized. It must be made plain at the outset that in thus emphasizing the importance of the human factor no belittlement of any other factors is intended, any more than in emphasizing the environmental aspect the importance of the forces of heredity is overlooked.

The age-long controversy on the question whether heredity or environment is the more potent factor in settling man's earthly destiny has reached a stage where a broad generalization may be made that on heredity depend his racial characteristics, the fundamental qualities that make or mar his life, what we vaguely term his constitution and still more vaguely his temperament, but that on the other hand, whatever may be his inheritance, his environment plays a large part in determining his health and longevity. The gradual acceptance by the scientific world of the theory of the non-transmissibility of acquired characters has helped us to this conclusion, as we have learned how much more illness is due to infection than was dreamed of by our ancestors. For an infection and its results on the human body are definitely acquired characters.

Many of the diseases termed constitutional a generation ago are now known to be the result of infections; in any medical ward at any time more than half the patients will be found to be suffering from infections or the result of infections; the four great causes of death in statistical tables are cancer, tuberculosis, pneumonia and heart disease. Two of these are infectious and fatal heart disease is in the majority of cases the result of a past rheumatic or syphilitic infection.

The closer study of the problems of inheritance and a better understanding of the history of infection have helped to explain those apparent contradictions which puzzled our fathers. Cases of pulmonary tuberculosis in the children of affected parents, for instance, are known to be due to the opportunities of early mass infection in childhood; remove a number of new-born infants from such opportunities for infection and no greater a proportion of them develops pulmonary tuberculosis than do average individuals. And what thirty years ago was called hereditary syphilis is now termed congenital syphilis because we know it to be due to an infection contracted by the unborn infant.

Increased knowledge has thus revealed that the influence of environment on the health of the individual is more extensive than was previously supposed, but that the influence of heredity strikes deeper in the life of the nation and race. Most of the conditions termed disease that depend on the hereditary factor are due to anatomical or perhaps serological defects, the most important of these being mental deficiency. Their prevention is the

¹ Delivered at Canberra on March 20, 1930.

function of eugenics. But to what extent and how that function is to be exercised or even brought into existence is still a matter for the future to determine. This point is overlooked in much of the glib and superficial talk about eugenics. As the late Professor Brailsford Robertson said in one of his last published utterances:

For humanity alone, among animals, spiritual values have a reality transcending material values. If, therefore, we were given power over the human race, and setting aside all outraged sensibilities, instincts and conventions, were to institute a human stud farm, we would desire to breed for spiritual rather than physical "points." That being so, what "points" would we breed for? For the most intense instinct of acquisition which would lead to incomparable "success" as we estimate success in our day? For military genius? For religious sense? How shall we ascertain the degree of possession of these talents and potentialities in our subjects? May not some of them prove to be mutually incompatible?

Such a quotation shows how far we must go before we apply eugenics in the body politic and make it clear that our immediately practical task is to deal with man's environment. Therefore, while we still agree with Oliver Wendell Holmes that in order to insure a long and healthy life a man needs to be careful in the choice of his parents and grandparents, we recognize that to secure freedom from disease and especially from infection he should be equally careful in the choice of his environment. As things are, however, it is often as difficult for a man to choose his environment as his ancestors and still more often his environment has affected his health before he has learnt to choose. Heredity keeps man constantly turned towards the norm of health, but environment determines whether the individual man shall keep healthy or be crippled by disease.

In confirmation of this it will be found that the great improvement in national and individual health that has been the boast of the past thirty years, is due largely to the attack on the faults in man's environment. It is entirely through the improvements effected in our social and domestic environment that we are able to point to an increase of ten to fifteen years in the average duration of life; to the stamping out or control of those plagues and epidemics like bubonic plague, malaria, cholera, yellow fever, which in bygone centuries decimated civil populations from time to time; and to a reduction in infantile mortality that in 1900 was looked upon as impossible.

These attempts to improve human environment began some two to three hundred years ago with the beginning of what was termed the new humanity; arguments for these efforts were strengthened with the dawn of the modern industrial world over a century ago. To them we owe those improved conditions in prisons, hospitals, mines, factories and dwellings which have culminated in what today we term domestic and industrial hygiene. As the spirit of humanitarianism increased, the national conscience was naturally aroused at the suffering and waste of life engendered

by epidemics. This feeling was stimulated by the growing interest in the problems of disease and by the threatened invasion of England with Asiatic cholera in 1831—just a hundred years ago. At this juncture we can see the controversy developing between upholders of the importance of the human factor in the spread of disease and those who emphasized the inanimate factors.

In 1831, on the first outbreak of Asiatic cholera in England, the Royal College of Physicians issued the following pronouncement:

Whenever objections arise to the removal of the sick from the healthy, or other causes exist to render such a step not advisable, the same prospect of success in extinguishing the seeds of the pestilence cannot be expected. Much, however, may be done, even in these difficult circumstances, by following the same principles of prudence, and by avoiding all unnecessary communication with the public out of doors: all articles of food or other necessaries required by the family should be placed in front of the house and received by one of the inhabitants of the house after the person delivering them shall have retired. Until the time during which the contagion of cholera lies dormant in the human frame has been more minutely ascertained, it will be necessary, for the sake of perfect security, that convalescents from the disease, and those who have had any communication with them, should be kept under observation for a period of not less than twenty days.

At the same time Southwood Smith and other reformers were insisting on the importance of filth and bad sanitary conditions in the causation of epidemics.

The extension and spread of these diseases being exactly proportioned to the extent of bad sanitary conditions, disappearing as soon as these conditions are amended, and never appearing when they are good.

Unfortunately the dictum of the Royal College of Physicians was issued regarding cholera, soon to be proved to be spread mainly by infected water. This discovery naturally strengthened the position of the sanitary reformers, as did the subsequent proof of the relation of typhoid fever to infected water supplies. During the next quarter of the century the prevention of cholera and typhus epidemics, the lessening of typhoid fever and finally the fall in the death rate of tuberculosis coinciding with improved housing and food supplies, all strengthened this argument. The horizon of the sanitary reformer gradually became almost limited to the sanitation of air, earth, food and water. Purification of water supplies had been shown to lessen fevers, Murchison was maintaining his theory of the origin of typhoid fever *de novo* from filth. Pittenkofer enunciated his soil theory of disease, Ballard promulgated the law that summer diarrhoea corresponded to the warmth of the soil four feet below the surface. Vaccination against small pox was looked upon as an isolated phenomenon in prevention. The conveyance of disease by air or fomites—those inanimate objects, like rags and paper that were supposed to harbour the disease virus for weeks or months—accounted for everything not otherwise explicable. Even the discovery of germ life in the latter half of the century and the gradual recognition of its relation to the causation of disease, strengthened for the

time being this theory of its spread, germs being supposed to be wafted on the air like angels or imprisoned in rags and paper like genii.

Public Health Acts were passed in England from 1848 onwards and in the different Australian States in the latter part of last century whose main purpose was the sanitation of air, soil, food and water. If these be consulted, it will be found that their first objective was the suppression of nuisances and that a nuisance depended mainly on the presence of effluvia. The supposed association of offensive smells with the causation of disease still persists in the public mind, though as a matter of fact there is no such association and smells really have much more to do with our comfort or discomfort than with actual disease. None the less the emphasis these enactments laid on the necessity for pure air has had a marked indirect effect on health as well as comfort and has partly accounted for many of the improvements in industrial conditions.

By the end of last century a wave of sanitary enthusiasm had developed which looked to these measures as the main factor in stamping out all communicable diseases. Isolation of the sick was, of course, practised, but with the prevailing ignorance as to the exact way in which different diseases spread, infectivity of the individual was regarded as coterminous with his illness and much the same degree of isolation was considered necessary for all diseases. The striking power of certain diseases was thought to be immense; during the 1889 pandemic of influenza stories were current of persons being attacked in isolated lighthouses and the epidemics of typhoid fever on the Western Australian goldfields in the last few years of the century were put down to dust conveyed organisms; small pox was thought to be aurally conveyed from small pox hospitals. All these theories naturally obscured the importance of the human factor in the spread of infections. Most other diseases were looked upon as constitutional; if the constitution were built up from infancy by the removal of insanitary conditions, good health would prevail.

It is only on some such grounds that we can explain the complete absence of any direct reference to national health in the *Commonwealth Constitution Act*, fiercely as that was debated in the last ten years of last century. Each State had previously possessed its *Quarantine Act* and its *Public Health Act*. The power of quarantine for the prevention of the introduction of disease from overseas was constitutionally handed over to the Commonwealth. But there seems to have been no consciousness of public health in Australia itself as a national problem. It seems to have been supposed that the panacea for ill health was sanitation by local authorities, that in fact, as Southwood Smith had laid down sixty years previously, disease disappeared as soon as bad sanitary conditions were amended and never appeared when they were good. Interstate commerce in food was recognized, but there seems to have been no conception of interstate commerce in disease. Power to deal with insurance

was given, but no power to insure public health by a national policy.

Contemplation of these facts enables us better than anything to realize the enormous change in our outlook during the past thirty years. This change has resulted from the systematic investigation of the problems of disease over an increasingly wider field. Theory has been replaced by study and investigation, as a result of which the range of preventable disease has been extended to departments of national and individual life previously undreamt of; wholesale measures of sanitation have been supplemented by individual attacks on different diseases. Garrison in his "History of Medicine" summarizes the change by calling the eighteenth century the age of theories and systems, the nineteenth century the beginning of organized advancement of science and the twentieth century the beginning of organized preventive medicine. The whole tendency of the change has been to emphasize the importance of biological rather than non-living factors in the problems of public health, so that even purification of water and sewerage is now recognized as due to biological activities. In the infections the growth of the science of bacteriology at the beginning of the centuries led to emphasis on the organism; since then it has been shifting to the reaction of the human host.

At the end of last century the domestic fly had hardly been thought of as a possible carrier of disease. In the early years of this century the importance of the rat in the dissemination of bubonic plague was recognized and this was followed in a few years by the demonstration of the rat flea as the vector. Knowledge of the part played by the mosquito in the spread of malaria and later of yellow fever followed and focused public attention on the importance of living vectors of disease.

Early in the century also the discovery that certain individuals who had suffered from typhoid fever, continued to be carriers long after their convalescence brought the human factor again into the picture and this was emphasized by the same discovery later with regard to the existence of human carriers in diphtheria and other diseases. About 1910 Chapin and others began to emphasize "contact infection" and in diseases accompanied by sneezing and coughing, the demonstration of the spread of infections of the upper respiratory tract by droplet infection developed the idea of direct infection from individual to individual. The growing recognition of the seriousness of syphilis and gonorrhoea, culminating during the war in the agitation for legislative and educative methods of prevention, convinced the public that in these diseases the sanitation of the individual was necessary rather than that of premises. The proof also during the war of what could be done in the prevention of disease among large bodies of men compelled to live on active service under the most insanitary conditions simply by measures directed to the individual, reemphasized this truth for other

diseases. This concentration on the human individual also was evident in the efforts for the maintenance of the health of munition workers.

Since the war the importance of the human factor in realms of disease, hitherto unsuspected, has been gradually recognized. The value of personal hygiene had, of course, been insisted on by the sanitary reformers of last century, but this has been strikingly reinforced in unsuspected ways. Apart from communicable diseases the influence of focal infection in producing disease has emphasized this point, even though its importance, as with all discoveries, has been exaggerated in certain quarters. In industrial hygiene it has been shown that it is useless to provide safeguards against disease or accident unless the individual cooperates in their use. One of the disquieting features of recent years has been the tendency of both employee and employer to make the presence or absence in a particular industry of alleged menaces to health an argument for or against shorter hours, rather than for both parties to cooperate in insuring that conditions are healthy. In 1924 the Medical Officer of Health in Newcastle-on-Tyne showed that the extension of water sewerage systems had not of recent years been invariably followed by a fall in the typhoid fever rate, but sometimes even by a slight increase, and that this seemed to depend upon the personal habits of the community in question. Similarly in regard to pulmonary tuberculosis, Professor Wynne showed that in England from 1911 to 1921 there had been an increase in overcrowding unequalled for seventy years, but that death rates from tuberculosis, pneumonia, scarlet fever and measles had nevertheless decreased by 50%, apparently due to altered habits. Investigations in the same disease in America early this century showed that by the age of ten over 60% of the child population were infected with tuberculosis, even though they showed no sign of the disease. On the other hand, in the last year or two various American observers have shown that the percentage of such infected children has fallen surprisingly in the last few years since efforts have been specially directed against the human reservoir of infection.

But while thinkers and administrators may recognize these facts, administrative methods, especially if dependent on legislation, always lag behind because of the time necessary for discoveries of experts to diffuse through the general community. Control over human carriers, for instance, was only secured in Victoria in 1919 and in New South Wales in 1921, while in South Australia there are even now no measures of control. At present, although the general body of citizens may know of the existence of carriers in typhoid fever and similar conditions, they have not yet realized the full implications of these recent discoveries, but still tacitly accept the position held at the end of last century, as the main feature in the story. The dramatic story of the suppression of malaria and the completion of the Panama Canal, the subsequent stamping out

of yellow fever from its age-long endemic foci in the West Indies, the publicity campaign regarding the menace to health from the household fly, have driven home to them the importance of insects as carriers of disease. But in thinking of man's environment they have been so impressed by the importance of the inanimate and insect forces in that environment that they have overlooked the human forces. They fail to recognize the fact that the most potent factor in any man's environment is the other human beings by whom he is surrounded. Although the word "sanitation" means measures designed to secure or preserve health, they think of the sanitation of places and things, but not of human beings; they talk of insanitary conditions, but do not think of insanitary individuals; they write letters about the disinfection of sleeping carriages on trains, but think nothing of possible infectiousness, except from tuberculosis, of individuals whom they may brush against on these trains. So ingrained is this attitude that it is still difficult to convince the average man that an outbreak of typhoid fever occurs only from the advent of a typhoid carrier or a person sickening with typhoid; that the most insanitary conditions may exist for years, but no case of typhoid fever will occur until a typhoid carrier or a person with a missed mild infection has entered the community and that the same holds true for diphtheria, bacillary dysentery and similar diseases.

Yet in Australia of all countries our history should convince us of the transcendent importance of this human factor. Some six years ago Dr. (now Sir) Andrew Balfour quoted the following letter written to *The Lancet* in 1837 by a medical practitioner who had just returned to England.

Having recently returned from Australia, where I was persuaded to go as the surgeon of a ship under the assurance of there being a great demand there for medical men, permit me to put young men on their guard against such an impudent imposition. The climate is the finest in the world; there is an abundance of everything at a cheap rate, plenty of employment, and the labour is well paid. Raiment and fuel are almost not needed; they have there neither endemics or epidemics, and the consequence of all this is Health of the Highest Order; and this the more marked from improvements of the health of all immigrants by the long voyage passed through a fine climate all the way, cheerful society, good living, rest, and the hope of bettering their conditions; with the novelty of the charmingly changed scene and climate on arrival and thereafter. However, let no man go as a surgeon without ample remuneration, bargaining also to be Brought Back. If he do not this, he must become a clerk or a cattle driver; or he must starve.

How different is this picture from present day conditions. The climate is the same, there is the same abundance of material supplies; judging from our beaches, raiment is even less needed. But the numerous brass plates in the main streets in each of the capitals testify to the alteration regarding the prevalence of disease. Illness has increased because fresh human beings have entered the country. Historians have traced the introduction of typhoid fever, diphtheria, scarlet fever, measles and other communicable diseases, not merely to

different States, but to different districts and always with the advent of human beings. As they have congregated into settlements, their ignorance or carelessness has set up insanitary or unhealthy conditions and, though of late years reformers have checked this in the cities, yet with the spread of motor car travel and camping parties, the same conditions will persist in country places if not checked by human intervention.

Our task at the present juncture, therefore, is not to belittle past measures and methods of sanitation, but rather to carry the idea of sanitation to its logical conclusion and cause it to include not merely places and things, but human beings. Study of the conditions obtaining in each of the States half a century ago shows how necessary and vital was this preliminary work to bring us to our present condition. The new developments which we hope for, would have been impossible without this foundation, but in order to build wisely on these foundations which our predecessors have laid, it is necessary to introduce or amplify new procedures. The knowledge of disease processes and epidemiology which we have gained during the past thirty years, enables us to do this with a precision that was then impossible. We have much to learn before we can perfect the new weapon, but we can at any rate see where we have failed through not using it more thoroughly in the past.

For progress in the prevention of disease comes not by dwelling on our successes, but by recognizing our partial failures and investigating their cause. The dictum of Sir James Paget in regard to surgery, that we learn more from our failures than our successes, holds good also for public health and indeed for all other departments of individual and national life.

Proceeding on these lines and examining our problem more in detail with the light of the experience gained by the intensive study of the past thirty years, we are now able to point out that our successes have been gained only in certain parts of the field of public health. There has not been the same general advance along the whole line of battle.

There has been a great reduction in those infections of the intestinal tract like the typhoid infections, the dysenteries and others which are mainly borne by water, food or milk. In other words, persistent and concentrated attack on inanimate factors in our environment has led to the control of these diseases which are mainly spread through these inanimate media.

Moreover, the special attack in a special way on these water-borne and food-borne diseases has led to much wider results than the mere suppression of these particular diseases. This is partly explained by Dr. Dublin's discovery that in people who had contracted typhoid and recovered, the mortality during the next three years is twice as great as amongst other individuals.

But while we have controlled these gastro-intestinal infections, if we turn to those gastro-

intestinal diseases like appendicitis, peptic ulcer and cancer of the stomach which apparently do not depend for their causation on such extrinsic infection, we find no decrease, but an alarming increase.

Similarly the dramatic successes gained in the control of malaria, yellow fever, typhus fever, bubonic plague—those scourges of the past which so impressed the imagination of our forefathers—have been due entirely to the recognition of their being insect-borne. It was this discovery in each case which made their conquest possible and which has extended success to the campaign against many other tropical diseases such as bilharziosis and the sleeping sickness of Africa which were similarly proved to spread by biological transmission through an intermediate insect host. Concentration of the attack on a particular part of a man's environment again brought success which was not attained so long as generalized efforts were blindly directed against miasma.

If now we turn to that class of infection whose chief effect is on the throat and respiratory tract, we must tell a different tale. Yet these include the commonest affections which exist in Australia and some of the most potent causes of death. Amongst them are such universal ailments as the common cold and influenza; such common disorders in children as chicken pox, mumps, measles, whooping cough, scarlet fever and diphtheria; such physical and mental cripplers as anterior poliomyelitis, cerebro-spinal fever and encephalitis; such serious diseases as small pox. With the exception of the last named which we have been successful so far in keeping out of Australia by our quarantine administration, these diseases are always in our midst. They are as much a matter of daily domestic concern as was typhoid fever some thirty years ago. Yet whereas that has practically vanished, these remain as frequent as ever. To this list should be added those two diseases which are so intimately bound up with some of these infections, pneumonia amongst the acute and pulmonary tuberculosis amongst the chronic infections.

These diseases are all alike in that they are chiefly and in some cases wholly spread by the nose and throat secretions; in some of them, as in measles and whooping cough, the vector is the sneezing individual in the early stage of his illness; in some of them, as in diphtheria and scarlet fever and pneumonia, he may be a convalescent carrier; in some, like diphtheria, persons with missed mild infections; in some, like anterior poliomyelitis and cerebro-spinal fever, abortive infections in which the nose and throat are involved, but the more serious sequelæ do not follow.

But none of them, except for occasional mechanical transmission by the house fly, depends for its spread on an insect vector. None of them, except for occasional outbreaks of scarlet fever, depends on milk or food as a vehicle of transmission. All of them mainly and some of them wholly are spread

directly from infective to susceptible individuals, either by contact or by droplet infection.

No one will deny the truth of the contention that we have gained no control over the spread of common colds or influenza. There may be less unanimity over some of the other diseases, such as scarlet fever and diphtheria, but this arises from confusing mortality with morbidity. It is true that we have reduced the death rate for these diseases. In South Australia, for instance, which is the only State where measles is notifiable, the epidemic of measles in 1925 was the greatest yet experienced—a total of nearly 15,000 cases in twelve months—yet the number of deaths was much less than in smaller epidemics of previous years. This decrease in mortality was largely due to the lessening of pneumonic complications as a result of the educational policy of the last thirty years which has led to measles being regarded more seriously by the average parent with resultant careful nursing. But graphs of incidence show the periodic epidemics at four to five year intervals, as was the case last century.

Similar graphs of scarlet fever show that both here and in England the case mortality has steadily fallen, although not to the same degree in Australia of recent years as in England. But they show equally plainly that in every State of Australia scarlet fever has run its epidemic or endemic course uncontrolled.

Similarly in diphtheria there is the same reduction in case mortality due to earlier and more accurate diagnosis and treatment through the use of bacteriological aid to diagnosis and the introduction of diphtheria antitoxin as a therapeutic measure. But the figures show a steady rise in the number of cases occurring in all the States from 1911 to 1921. Since 1922 there has been just as inexplicable a fall again, though never to the level of the first years of this century. In other words diphtheria has run its course uncontrolled during the past twenty-five years, just as scarlet fever and measles have done.

We are compelled to admit, therefore, that our past methods have failed to control the spread of these respiratory and throat infections. And this failure results from the fact that in these diseases the human factor is the most important. In any given infection we may attack the organism as it leaves the infected individual or in its path between individuals or we may protect the susceptible individual. We have succeeded in those cases where the path is long or by way of an intermediary. Where there are only two human beings concerned, the infective and susceptible, we have failed. Our main attack has been in the wrong direction. For these infections are uninfluenced by what are ordinarily termed sanitary improvements. Measles bears no relation to milk or food, only to contact between two individuals with apparent coryza. Diphtheria bears no relation to drains, though it may to drainage of the nose; scarlet fever bears no relation to septic tanks though it may to septic

tonsils. Contrary to old ideas none of them is conveyed by fomites, yet more attention is still paid to terminal disinfection than to the disinfection of the individual.

The disinfection of a room after a patient has left it, plays no part in lessening the spread of most of these diseases; this is still more true of the perfunctory disinfection done in most country districts. No case can be cited where another case of measles or mumps has arisen from neglect to disinfect a room where the child was nursed or a classroom where the child attended. And these diseases will not be prevented until the public is fully convinced that practically the only important factor in their spread or control is the human factor.

It may be objected that we have considered the human factor in our insistence on the isolation of the sick persons and the quarantine of contacts. That is true; it is also true that the decrease in case mortality in scarlet fever in England appears to correspond almost exactly with the gradual increase of hospital accommodation of such patients. But there are very few administrations where quarantine of contacts can be adequately carried out. Moreover, the individual is often infective, as in measles and whooping cough, before he is recognized as sick; often his sickness is missed altogether. Moreover, legally only certain of these diseases need be isolated and of these, legally again, there is the same measure of isolation for a patient with bubonic plague, where it is quite unnecessary, as for a patient with small pox, where to be effective it demands a hospital.

Generally speaking our administrative machinery in this respect has not kept pace with our present day knowledge of the need for differentiation in regard to difficult diseases. We have recognized this in regard to syphilis and gonorrhœa in which the human factor is similarly potent, and have enacted entirely different methods of attack. But in regard to all these other diseases, they are only infectious if so proclaimed and our machinery for the control is built up on the old ideas of infection.

To be successful in gaining control over these infections it is necessary for us to concentrate our attack on the human host or susceptible individual.

In the past we have chiefly paid attention to the infective individual. For as we have seen from our first attempt to control infections, isolation of the sick has been practised. But if we are to bring our practice up to the level of our present day knowledge, considerable modifications of procedure are necessary. A person in the early stages of a common cold or influenza is far more dangerous to his fellow citizens than a person with bubonic plague who is practically innocuous. Yet the former attends his business if able and the latter would be objected to by most citizens as their neighbour in a hospital bed. Only certain diseases are legally required to be isolated and these vary in the different States. If we are to deal with this problem seriously it seems absurd that com-

pulsory isolation of measles and whooping cough should be required in one State and not in all. The degree and length of isolation need also to be standardized. The desirability of these reforms has been affirmed by conferences of medical experts, but until legislators and the lay public generally show an intelligent interest in the necessity for them, nothing will be done. And it seems a counsel of perfection with our present ethical standards to expect citizens when they are in the early stages of an infection to put the interests of others in front of their business arrangements.

In past days infectivity was supposed to cease at the end of illness. Nowadays in diphtheria it is the recognized practice for patients not to be released till two or three normal swabs from the nose and throat have been secured. But not all hospitals and practitioners as yet insist on convalescents from typhoid fever being proved non-infectious before being released.

Through the existence of missed mild cases in other infections the infective individual is ubiquitous. This has been recognized in the ever increasing horde of inspectors controlling milk supplies, eating houses and restaurants, even to the chips in cups.

But these precautions cover only a small portion of the field. For instance, both in scarlet fever and diphtheria the proportion of susceptible children steadily rises from the age of two years to six. By far the largest proportion of deaths from measles, diphtheria and whooping cough occur before the age of five, anterior poliomyelitis is so essentially a disease of early life that it has long been known as infantile paralysis, and scarlet fever, diphtheria, measles and whooping cough are known as the school-borne diseases because their greatest incidence is in children of school ages. These diseases are all spread by secretions of the nose and throat and twenty years ago Chapin amusingly satirized the position as under:

Not only is the saliva made use of for a great variety of purposes and numberless articles are for one reason or another placed in the mouth, but for no reason whatever, and all unconsciously, the fingers are with great frequency raised to the lips or the nose. Who can doubt that if the salivary glands secreted indigo the fingers would not continually be stained a deep blue, and who can doubt that if the nasal and oral secretions contain the germs of disease these germs will not be almost as constantly found upon the fingers? All successful commerce is reciprocal, and in this universal trade in human saliva the fingers not only bring foreign secretions to the mouth of their owner, but there, exchanging it for his own, distribute the latter to everything that the hand touches. This happens not once, but scores and hundreds of times during the day's round of the individual. What avails it if the pathogens do die quickly? A fresh supply is furnished each day. Besides the moistening of the fingers with saliva and the use of the common drinking cup, the mouth is put to numberless improper uses which may result in the spread of infection. It is used to hold pins, string, pencils, paper and money. The lips are used to moisten the pencil, to point the thread for the needle, to wet postage stamps and envelopes. Children "swap" apples, cake and lollipops, while men exchange their pipes and women their hatpins.

Children have no instinct of cleanliness, and their faces, hands, toys, clothing, and everything that they touch must of necessity be continually daubed with the secretions of the nose and mouth. It is well known that children between the ages of two and eight years are more susceptible to scarlet fever, diphtheria, measles, and whooping cough than at other ages, and it may be that one reason for this is the great opportunity that is afforded by their habits at these ages for the transfer of the secretions. Infants do not, of course, mingle freely with one another, and older children do not come in close contact in their play, and they also begin to have a little idea of cleanliness.

The danger to the child comes directly he leaves his own backyard and mixes with other children. Investigations have shown that in large American cities nearly 70% of children are infected with tuberculosis before they are ten, simply from the opportunities of picking up infection through contact with other people. Going beyond the infections, we are confronted in recent years with the rapid increase in deaths and injury from motor accidents directly the child enters the two to five age period. And when we turn to functional nervous disorders in later life none of us has the faintest conception of how large a proportion of those are based on psychical shocks received in the same period of early childhood, not merely from the din and noise of city life, far different from the conditions under which our special senses were evolved, but in the constant exposure of the city child to all the terrors of the human jungle. It is rather outside my province tonight to dwell on strains and stresses of the nervous system in adult life which are the cause of so many breakdowns, beyond pointing out that these in themselves would form a chapter in the full story of the influence of other human beings on our lives and health.

The ubiquity of these human influences in the causation of disease, whether infectious, traumatic, dietetic or psychical, adds to our difficulty of control. We can determine the movements of water, but not the actions of people, except in rare circumstances. Our difficulties are increased by our ignorance. Much as we have learned in the last thirty years, we are still only on the fringe of the sea of knowledge. Returning to the nose and throat infections for instance, in many we have not yet learned the identity or life habits of the causal organism. With some of them, like influenza, we have no certain means of diagnosis, so that the term influenza covers a multitude of sins of diagnosis. Even of diphtheria, of which we have the most exact knowledge, we are quite ignorant why sometimes it assumes epidemic or even pandemic form. Thirty years ago scarlet fever was thought to be communicable through the desquamating skin. Although we now know this is incorrect and have discovered the causal streptococcus, this has but revealed our ignorance of its relation to other strains of streptococci, especially those of septic tonsillitis, rheumatic fever, erysipelas and puerperal fever.

All recent additions to our knowledge have been gained by substituting observation and experiment for theory; and further necessary knowledge can

only be gained in the same way. It is realized, for instance, that we can hope to control maternal mortality and still-births only by a careful investigation of each case as it occurs and this has been recommended already by the National Health Commission in 1925, by the Federal Health Council and by Dame Janet Campbell in her recent report. We know that puerperal sepsis depends almost entirely on human factors, not on home or hospital in itself, but on the medical attendant or midwife or patient herself, on traumatism possibly or possibly the lack of vitamin A in her diet. But the delay in investigation arises from other human factors, from that queer lack of imagination which leaves us unmoved, although over five hundred women die annually in Australia from puerperal causes, while owing to the effects of tradition we are wildly excited when one individual occasionally dies from small pox.

And while private individuals and governments cheerfully make available large sums of money for investigation into diseases of sheep and tomatoes and bananas and the tobacco plant, few seem to regard healthy human beings of sufficient economic value to merit investigation into the natural history of their diseases. Institutions have now been established in several of our large hospitals and universities for research into the more abstruse, underlying problems and into cancer, and in every hospital clinical investigation of disease is taking place, but in addition field investigations on an adequate scale are needed. An investigation that would result in the removal or prevention of chronic arthritis, for instance, would greatly increase national efficiency and save large sums annually in pensions and the field is available in those receiving pensions for this complaint. Turning once more to the infections, beyond work of this description in regard to diphtheria at Bendigo, Broken Hill and other places in New South Wales, little has been done. In America extensive campaigns have been carried on, the latest being a deliberate investigation on catarrhal infection of the nose and throat by continued observation on members of a community. A few years ago Topley added greatly to our epidemiological knowledge by actual experimentation in regard to certain infections in colonies of mice, controlled in regard to temperature, food, entrance of strangers and other conditions. It is impossible to secure such conditions in human communities, but something approaching it can sometimes be obtained. Theoretically a self-contained community like Canberra under one health authority with its main population fixed and with regular incursions of birds of passage, should be an ideal centre for such an investigation, but I fear it would be too much to ask the nomadic population to submit themselves to any such observations for the public weal.

And this brings us to the real problem raised by the existence of the human factor—the unwillingness of the ordinary individual to submit to control or investigation for the sake of others. Men will

offer their blood for transfusion because it touches their sense of the heroic; they will not stay at home with influenza because it seems cowardly; they would not submit to routine examination of the flora of the nose and throat because it seems ridiculous. Scientists propose to attempt to abolish tomato wilt by raising strains of plants resistant to wilt. But imagine an administrator putting forward a policy for raising families of measles-resistant children! Bovine tuberculosis is being stamped out by regular testing of herds and destruction of all affected animals with compensation to the owner. But so far not even the most thorough-going reformer has suggested such a method of dealing with pulmonary tuberculosis and it is hard to conceive of a cabinet minister supporting such a proposal, unless he were sure that all the infected were confined to his political opponents! How limited our opportunities for effective service become directly this human element intrudes itself!

During the war in many recruiting camps very determined efforts were made to stamp out mumps and measles that had gained entry in camp, and American practitioners in particular were emphatic as a result of their experience that any such attempts were hopeless until we gained some specific immunizing agent for each disease. All these difficulties have made many investigators question whether it is not better to allow people to get their milder infections without any attempt at control. They may think the results are not commensurate with the trouble and expense or that in our concern for the individual we are ruining the race by thwarting Nature's efforts to secure a highly resistant strain. On the other hand, it must be remembered that the indirect results of some of these milder infections are extensive and that from influenza alone during the past few years we have lost some of the finest brains in the Commonwealth. We have already gone too far in removing natural checks to tarry to discuss this academic question.

The difficulty of perfect control of the source of infection, where that source is human, has become all the more apparent in our attempts to control those chronic infections like syphilis, gonorrhœa and pulmonary tuberculosis. For in these we have perambulating reservoirs of possible infection, intermittent in some cases, too long continuous in other cases to admit of continued isolation, but not disabled enough to refrain from ordinary community life. Therefore in these diseases attempts have been made to cut short infectivity, in some cases by chemical means, as we would chlorinate wells or streams, in tuberculosis by physical means. Both methods have proved liable to break down through the influence of human passion or human cupidity or human affection or responsibility—when the healed tuberculosis patient resumes work too soon because of the claims of his family.

And this recalls our attention to the point already made in regard both to cases of infective-

ness before and after visible signs of illness, that attempt as we will to confine our attention to the purely medical aspects of disease, we are driven back to ethical questions by this human factor when we attempt to deal with prevention. The Americans say that our methods are failing to control venereal disease because of the absence of a sense of personal honour; we see on all sides the impairment of public health that continues owing to an imperfect social conscience in individuals.

Faced with these various difficulties in our attempt to control the infective individual, the tendency has been of recent years to turn to the susceptible individual. The old idea was to maintain his general health and thus render him less liable to infection. But a man with the highest general resistance will succumb to measles, if not immunized by a previous attack and if in sufficiently close contact with an infective individual. We appear to need a specific resistance for each of these infections. Even where we still try to maintain a high general resistance as in tuberculosis, it is because we recognize that most of us are already infected with tuberculosis.

The tendency, therefore, of recent years has been to turn to the immunization of susceptible individuals at the most likely road to success. And discoveries have strengthened this tendency. For a century until 1907 small pox was the only disease in which a successful method of immunization had been discovered. Then antityphoid vaccination was introduced and similar measures with modifications were subsequently discovered for tetanus, diphtheria, scarlet fever, measles and others.

For many of them we are still ignorant of satisfactory immunizing measures, but if these can be discovered, this method seems the more scientific way. It follows Nature's example. Epidemics of measles seem to die out because of lack of susceptible material and to arise again when a sufficient number of susceptible individuals has again been produced. Even though we do not perfectly immunize every individual, we reduce the opportunity of spread. Topley's experimental work showed that as an epidemic progresses, many more in the colony become immune than have actually developed disease, apparently by receiving repeated small doses of the poison. This apparently explains the gradual development of immunity to scarlet fever and diphtheria, as individuals previously susceptible approach adult age. Encouragement to this policy was given by the notable success of antityphoid inoculation of the troops in the Great War. And this was supported by one hundred years' experience of the success of vaccination against small pox, in which compulsory vaccination in infancy and revaccination in seven years, although not completely protecting every individual, adequately protected the community.

But in both these cases the measure was compulsory. In the case of typhoid this was possible owing to military discipline, in the case of small pox

because that disease had been so dreaded, both from its mortality and the disfigurement of those who recovered. Consequent on the long continued safety given to us in Australia by our position and an effective quarantine service, compulsory vaccination against small pox has become a dead letter. Even in England the occurrence in recent years in epidemic form of a mild variety of small pox has led to considerable discussion whether so mild an attack is not preferable to vaccination and this argument has been reinforced by the occurrence of a few cases of encephalitis after vaccination.

In a civilian population compulsory measures are possible in time of emergency when the populace is in a panic. In ordinary times they are possible only if the majority of the population has an intelligent appreciation of the benefits resulting from their acquiescence. But the remedy must not appear worse than the disease. Individuals subject to quarantine against small pox, whether professors or professionals, may fulminate against the inconvenience; the general population will uphold the principle, but will themselves sign conscientious objections to their own infant being vaccinated, if that course is less trouble than two or three restless nights with the child a week after vaccination.

It is generally recognized that in the past, public panics have nearly always been at the back of any great advance in public health. Witness the cholera epidemics in England in 1831 and 1848 with the resulting sanitary reforms, the typhoid epidemics in Australia fifty years ago, the appearance of bubonic plague in Sydney in 1900, the concern about venereal disease during the war. It was this which led Dr. Andrew Balfour to say, commenting on a report of 1882 regarding apathy over sanitary reform in Western Australia:

It is the same old story. What Western Australia needed was a good going epidemic preferably of cholera, the great loosener of purse strings.

But panic is a bad thing on which to rely; for many foolish things are done under its influence, as was witnessed here in regard to masks and inhalation chambers in the influenza epidemic of 1919.

Moreover, as scientific knowledge of the true nature and course of a dreaded disease increases, so does panic recede and in certain cases even fear becomes lost. This, of course, is not always true. A generation ago the ignorance of the late manifestations of venereal disease led patients to fear it less in the early stages and thus neglect the prolonged treatment necessary to make them non-infectious. Hence Fournier's dictum: "Men must learn not to be ashamed of syphilis, but to fear it." A generation ago the same ignorance regarding the seriousness of measles, especially in infants and young children, caused it to be treated with much less respect than at present. On the other hand, the fear of being thought tuberculous, with the stigma supposed to be attached to it, has undoubtedly hindered efforts at its early diagnosis and control.

But on the whole, with the passing of fear it becomes impracticable to enforce compulsory cooperation. And if this be true of vaccination against small pox, how much more true is it of those diseases which are always with us, familiarity with which has bred contempt. In addition immunization measures against these diseases are only in the initial stages, much as was the case with small pox a century ago.

Compulsory cooperation being recognized as impossible, attention has been directed to the best means of securing voluntary cooperation. With the human desire for short cuts, immunization campaigns on a large scale have been planned and carried out in various parts of America against different infections. But it is doubtful whether such measures would be acceptable or successful in Australia. Moreover, there is always the possibility in such campaigns of some accident occurring on a large scale with its attendant tragedy. And the remembrance of such accidents lingers long in a small community and retards further experiment. These mass measures may be necessary with a large alien population, imperfectly educated, for in such circumstances intelligent individual cooperation is more difficult to obtain. With our smaller and more scattered population and a higher average standard of education than any other community possesses, it would seem that a more educational policy is likely ultimately to give better results. It has been repeatedly proved that once the situation is fairly explained to an Australian individual or family and some hope of success held out for the measures proposed, willing cooperation is generally secured to an extent that was unexpected a few years ago. Progress is naturally slower than by compulsion or by mass movements, but in the long run it is steadier and more permanent.

A hundred years ago our ancestors in England similarly resisted the sanitary innovations introduced to prevent cholera, that today are automatically employed by every householder.

The slow progress that attends voluntary measures in part explains the disillusionment and disappointment that has come to so many during the past ten years. Large bodies of men returned to Australia exhilarated by their knowledge of what had been done for the prevention of disease in the army; they saw no reason why the same results should not be achieved at home. Our apparent failure to progress has puzzled and disheartened them. They have failed to see that for one thing the general public have not yet grasped the necessity for this effort against human susceptible individuals which they saw carried out in the war, and until that is fully grasped, we cannot expect the cooperation of a civilian population, much less compel it.

It is disheartening, for instance, to see in this present year the citizens of Broken Hill declining to be vaccinated against typhoid and preferring the risks of typhoid fever, yet one must remember that they have been brought up with the idea that typhoid

is prevented by proper sanitation of water and premises and that, confronted with a new measure, they shrink from its application, especially when it involves personal inconvenience.

Ignorance or out-of-date knowledge must therefore be replaced by education of the public in what the scientific world has learned. Self-interest must be enlisted and reinforced by sympathy for others. It has been shown that some of the earliest public health reforms arise from the humanitarian impulse and it is certain that this impulse must be strengthened and scientifically directed if efforts directed against human vectors of disease and the human activities that cause disease are to be more successful.

Undoubtedly one reason for the success of voluntary effort in the reduction of infantile mortality has been the growth of the spirit of compassion for the helplessness of infancy that has marked this century. Secounding this (to turn to the other side of our argument) is the fact that the infant himself is not able to make any conscientious objection. He is but "an infant crying in the night, and with no language but a cry" and must submit to the will of his mother who again is influenced by her maternal instinct.

In this respect the infant welfare movement serves as an example of the way in which other advances may be expected to come in the future. At the beginning of the century the downward trend in infant mortality which had begun some ten years earlier, had been interrupted by the extensive substitution of artificial feeding for natural feeding. A few medical experts took up the subject and began a campaign for more natural feeding. The universal interest in the helpless infant assisted to enlist public interest, voluntary associations were formed which worked in association with government or civic authorities. The appalling mortality in babies' homes was shown to be due to infection spreading rapidly from child to child once it was introduced into an institution. Individual attention was substituted, mothers were instructed and their lives supervised with consequent reduction in infantile mortality. More intense study of the subject about ten years ago showed that this reduction was limited to the later months of infancy and was due almost entirely to reduction in gastro-intestinal infections. Mortality in the first month was shown to be due to entirely different conditions, human factors again, which also were at work in the production of still-births, hitherto looked upon as a natural necessity. The same process of study and experimentation has been necessary in this field and this in turn has led to deepened interest in the control of maternal mortality, since both are due largely to the same factors. But it is much more difficult to visualize the unborn child and its needs than the sickly, wasting child. Consequently the movement is slower. It is also more difficult to excite the same compassion for the mother's welfare, because she does not present the same picture of

helplessness. None the less the younger mothers are gradually learning the necessity of prenatal supervision both for their own and their unborn infant's welfare. It has been steadily reinforced by the growing attention paid for the past ten years to the more definite instruction to medical students on their responsibility for the solution of the maternal and neonatal mortality problem. All this has been done with practically no fresh legislation but by education through experiment and by the voluntary cooperation of medical practitioners and mothers, with the inspiration derived from the backing of administrative and educational authorities.

We have seen the growth of precisely the same movements in surgery. Lister's original conception was that of infection spreading to wounds by the air and his earliest measures were directed against that danger, just as was our attitude regarding respiratory infections at the beginning of the century. Later it was proved that the human factor was important in the surgical infections and that these infections in operative procedures were just as much contact infections as we now regard respiratory infections. In our own generation we have seen the controversy as to whether rubber gloves were necessary to insure the protection of the patient against this contact and the gradual perfection of aseptic methods. But all this has been done by the voluntary efforts of individual members of the medical profession. The extension of the rudiments of this knowledge to the general public in the first aid treatment of wounds, with the formation of bands of first aid trained workers in railway organization, boy scouts, girl guides and similar educational organizations, has saved an inestimable amount of suffering from shock, haemorrhage and sepsis in accidents.

Similarly, following on the experience thrust on the medical profession in the Great War, one now sees the younger generation of medical practitioners automatically using tetanus antitoxin at the first dressing of any wound likely to be contaminated by soil. In the last few years an increasing number of practitioners is protecting the family contacts of a case of whooping cough by injections of pertussis vaccine.

The most recent example of the same procedure is in regard to that disease so intimately associated with the name of the founder of the fund for this oration. Known as infantile paralysis at the beginning of this century, the most careful medical lecturers saw then that nothing could be done to avert the paralysis, because the damage to the spinal cord was done before the patient was seen. The mode of spread was then unknown; it was thought to be largely due to seasonal influences. Later it was thought to be spread by an insect. Later still it has been proved to spread largely by persons with abortive infections. Later the curative properties of the serum from convalescent patients were proved. And the voluntary campaign in Melbourne during the past two years, inspired by civic

authorities, financed by voluntary subscription, controlled by a voluntary committee with which medical officers of health and the Commonwealth Serum Laboratories associated themselves, and practising members of the profession voluntarily cooperating with the trained medical expert in securing the early treatment of these patients, has proved that the paralysis can be checked by early treatment, that during an epidemic cases can be diagnosed before the paralysis occurs and the paralysis prevented. It only remains to go one step further and such or similar measures can be applied in times of epidemic to those likely to be exposed to infection.

And it can be safely prophesied that as soon as a method of immunization against any infection is proved to be satisfactory, practitioners will hasten to use this for the contacts of their patients. This will be totally different in spirit from the old compulsory vaccination against small pox. It will have the advantage of avoiding the likelihood of those disasters on a large scale the tragedy of which has retarded the more extended use of protective measures against diphtheria and indirectly has prejudiced the use of such measures in other diseases.

In the case of the medical practitioner, as his exact knowledge concerning different diseases grows, professional interest and enthusiasm will always supply that stimulus which is necessary for progress in prevention. This knowledge has been inculcated during the last ten years in all our Australian universities with medical schools, in which all medical students have received special courses in the principles and practice of these preventive measures. Thus the majority of medical graduates now enter practice keen and trained to prevent as well as to treat disease. The new situation thus being created has not yet been properly realized by the general public or administrative authorities. Given proper encouragement, these younger practitioners will work as hard for community health as a past generation did for surgical asepsis. And the new school in Sydney will still further raise the level of this teaching on prevention, both in its own university and indirectly in its sister universities.

In regard to the general public, there is the same necessity for education in a much more general way, if human individuals who in the past have been so potent a factor in spreading disease, who are now through their prejudice or ignorance a similar potent factor in retarding prevention of disease, are to be made in the future, an equally potent factor in the promotion of public health.

Much discussion has in recent years taken place on the various ways in which this education can best be carried out. All sorts of methods have been suggested, but it can be safely said that there is no short cut; there must be gradual permeation of the mass by the leaven of prevention. Through the sanitary reforms instituted last century, the present generation of adults were trained in their childhood

and adolescence in the importance of personal cleanliness in the primary functions of life. As a result a revolution has quickly occurred so that where thirty years ago babies were kept in darkened rooms and artificially fed as soon as possible, young parents now naturally leave their infants awake and asleep in the open air as much as possible and feed them naturally as long as possible. In children and adolescents frequent bathing and abundant exercise have become the natural habit.

It is becoming more and more evident that the fresh advance will come in the same way and its full results will be seen only as the present young generation attains mature adult life. The great advances in warfare come not by frontal attacks, but by turning movements and the same is true of warfare against disease. And in Australia one of the greatest agencies in effecting this succession of turning movements is the educational system in existence in our different States. Thirty years ago universal compulsory education was recognized as the cause of defects of eyesight, curvature of the spine, neurasthenia and similar complaints. Later the schools became noted as the mart of exchange for what were termed the school infections—measles, whooping cough, scarlet fever and diphtheria.

Now they are one of the most potent means we have for exploiting the human factor as an agency in the prevention of disease. It is difficult to conceive how much sepsis and septic complications of disease have been lessened through thousands of school-going children daily being taught during the past thirty years habits of individual and communal cleanliness. Morning inspections, toothbrush drill, *Kindergarten* songs and pictures teach this lesson to them day by day. Classes in domestic economy are teaching the mothers of the future the essentials of good cooking and the economic purchase of foods with proper food values. And Dame Janet Campbell has now suggested that mothercraft should be taught to these girls in the same way.

Regular medical and dental inspection of all State school children has now been in vogue some years throughout Australia, the aim being to examine each child two or three times during his school life and to have the parents and family medical attendant cooperating in the remedying of any defects thus found. The only regret is that this practice is not yet fully established in our secondary schools and universities. Yet some schools follow the practice and the avowed intention of the new school at the University of Sydney is with the consent of the Senate to perform this function for undergraduates there. In the future it will be impossible to meet with those individuals of fifty or seventy years, as the case may be, who have never seen a doctor.

For the first time in human history a whole nation is growing into adult life who as children and adolescents have been introduced to the medical

practitioner as a preventer of disease. The effect of this as they reach middle life is incalculable. All thinkers are agreed that apparently the only hope for the prevention of those diseases of middle age which only ten years ago were regarded as outside the scope of prevention, is the periodic examination of individuals as they approach that age. This implies more than a perfunctory examination, tests to detect incipient high blood pressure, a renal function test to detect kidney disease or arteriosclerosis that seems to be impending, sugar tolerance test for the prevention of diabetes. More and more we realize that our only present hope for the reduction of cancer mortality is by such periodic examination and dream even of examinations that may give evidence of an impending cancer of the stomach. Such a state of things is a very dim and distant vision, but the atmosphere for it to become possible is being created in the minds of these children as they undergo more or less regular medical inspection in their schools.

All this means a new outlook and a new use of this human factor. When we add to it the universal training on preventive principles of our future practitioners, we see the possibilities of widespread voluntary cooperation in this campaign for better private and public health.

This too means an entirely new conception of health administration, an administration that is educative and inspiring rather than compulsory and formal, a central administration with its skilled advisers, a gradually increasing company of area medical officers who shall be in close cooperation with the practising members of their profession who in their turn will be performing many duties that are rightly theirs, but have in the past thirty years been diverted from them into the hands of nursing or health inspectors.

Administrative leaders already have such a vision, but can put it into practice only as the public understand the developments possible by one use of this human factor. For an administration, mainly concerned with inanimate things, tends to become a machine and a thing of red tape; the entrance of the human factor breathes into it the breath of life.

SURGICAL CLINICS IN NORTH AMERICA.¹

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THE visitor from Australia to the United States of America and Canada in search of clinical knowledge finds that his task is made easy and his visit enjoyable by reason of the cordial helpfulness with which he is met. He sees magnificent hospitals, all planned for greater efficiency in service to patients, education and research; great wealth of facilities,

¹ Read at a meeting of the Victorian Branch of the British Medical Association on February 5, 1930.

of clinical material and financial resources. But that which goes to his heart is the friendliness and warmth of his welcome and the ready and willing manner in which all his requests for help and information are met. The personal contact with men who have for years been but names, although their written work has been well known, is the most enduring impression of such a visit.

The task of passing on in any effective way the impressions obtained and the knowledge gained is not easy, but it is a pleasure to express my deep appreciation of all the kindness which I experienced and which I am sure will be experienced by any other visitor who shows he is willing to learn.

The interest of surgeons in America in the work being done in Australasia is noteworthy and recognition is always paid to workers like Royle and Hunter, Apperly and others.

Hard, steady work in surgical research is evident at all the clinics which I visited. Enthusiasm for new ideas is tempered by a reasonable scepticism; well-tried, standardized methods of operative technique are used, but every device which makes operating easier and safer, is quickly adopted. I did not see anywhere attempts at quick dramatic operating "by the clock," but, on the other hand, there was evident a fastidious attention to detail in operative work.

Surgery of the Nervous System.

I saw some interesting operations on the brain performed by A. W. Adson and J. R. Learmonth at Rochester, by Cushing at Boston and by Dandy at Baltimore. In all cases the lesion had been accurately localized before operation and the operative technique was marked by good haemostasis with dry fields and wide exposure with large osteoplastic flaps. In two instances a cerebral tumour was removed; one, a frontal lobe tumour, was removed by Dr. Harvey Cushing with the aid of the Bovie unit under local anaesthesia, the other by digital enucleation of a temporal lobe tumour, under ether given by the rectum and local anaesthesia, by Dr. Dandy.

Slow, deliberate methods characterize all these surgeons. Anaesthesia is a matter of individual preference and I saw operations performed under ether given by the open method and also with local anaesthesia aided by a little inhalation or by ether given by the rectum. In no instance was ether administered by the intratracheal route.

Haemostasis of the edges of the scalp flaps is effected by the use of many artery clamps which are tied by the handles in groups of six; sixty forceps were used in one operation and, being tied in groups, they acted as efficient retractors. For bleeding from the bone edges Horsley's wax and pieces of muscle were used and in the *dura mater* silk ligatures, Cushing clips and muscle pads. Bleeding from the operation area when the tumour is being removed is controlled by swabbing, suction, douching, clips and threaded pads and by electro-coagulation at the Brigham Hospital, Boston.

I was able to see Dr. Cushing remove a frontal lobe meningioma by the electrical method of primary intracapsular enucleation which he reported recently. By this method the central portion of the tumour is "scalloped" by the cutting electrode attached to the Bovie electro-surgical unit with a minimum amount of bleeding, so that the shell of the tumour is more safely and with less contusion brushed away from the enveloping brain tissue.

A large osteoplastic flap was raised in the right frontal region and Cushing very gently and deliberately commenced raising the base of the brain from the bone, using swabs on forceps and "brushing" the brain from bone till he reached a depth of about 7.5 centimetres (three inches). With trocar and cannula two exploratory punctures were made from the anterior aspect of the brain. The tumour was found on the inferior surface of the right frontal lobe and piecemeal removal was commenced with alligator forceps, the brain being displaced with flat retractors. Haemorrhage was immediately checked, frequently by pressure with dressing forceps which were touched by the electrode held by an assistant, thus causing electro-coagulation. Other methods of haemostasis were also used as mentioned above. After considerable piecemeal removal of the tumour with forceps, the electric knife was brought into action for "scalloping" and all tissue removed was collected in small glass vessels. The tumour was of large size and its capsule was at times dragged on gently, apparently to estimate its extent. I was unable to watch the completion of the operation, as after Cushing had been at work for three hours, I had to leave to catch a train for New York. Cushing had four surgical assistants, one being in charge of the Bovie unit, supplying the appropriate current for dehydration, coagulation or cutting, and one held the sucker which was in constant use. After two and three-quarter hours of local anaesthesia the patient complained of discomfort and ether was administered.

Throughout the operation the patience, gentleness and skill of the master neurosurgeon were much in evidence. Cushing insists that this new adjunct to crano-cerebral surgery does not displace the established principles of osteoplastic intracranial surgery, but that it does allow of piecemeal removal, with a minimum of haemorrhage and without risk of the inoculation of the operation field by viable tumour cells.

W. E. Dandy, at the Johns Hopkins Hospital, Baltimore, removed a tumour from the right temporal lobe by inserting a finger after incising the cortex and partially enucleating the growth, the remnants being removed by blunt dissection. This involved removal of practically the whole of the right temporal lobe, the optic nerve being exposed anteriorly, the temporal fossa being left clear of its contents. Only the tip of the descending horn of the right lateral ventricle remained, the choroid plexus being excised on presenting itself. The large gap left was covered by suturing the *dura mater* over it.

At the Mayo Clinic Learmonth did a decompression for a glioma of the right fronto-temporal region and also for a cerebellar tumour, but removal was not attempted.

I saw Adson operate on a boy with a chronic abscess in the left frontal lobe. He said that he would not operate in the presence of acute infection, when there was meningitis present and before

immunity had developed. He waits for at least one month or until the temperature has fallen and the leucocytes have levelled down to 14,000 or 15,000 per cubic millimetre. He objects to aspirating a brain abscess, having been trained as a general surgeon with a belief in free incisions, and if the brain is damaged more by free incision than by aspiration, this is compensated by thorough evacuation of pus and the avoidance of leaving undrained pockets.

In this patient he made a two-stage approach over the left supraorbital region and the pus was located and evacuated by cannula and the abscess packed and drained by catheter.

The development of the surgery of the sympathetic nervous system has reached an interesting stage at the Mayo Clinic in its application to vaso-spastic conditions, such as Raynaud's disease, scleroderma, Buerger's disease of the extremities and certain types of polyarthritis. The work of Royle, of Sydney, has stimulated much of this development, but Adson regards ramisection and division of the cord as not going far enough and he removes in addition the sympathetic ganglia.

Owing to incomplete clinical results and technical difficulties in the Royle anterior approach to the thoracic ganglia as done by Adson, he adapted the operation devised by Henry for removal of the ganglia by a median posterior incision which allows of bilateral ganglionectomy and ramisection at one operation. I saw this operation done by W. McK. Craig, Adson's associate, on a woman of thirty-five suffering from Raynaud's disease of the upper limbs, the operation taking three and a quarter hours under ether anaesthesia. Craig works slowly, carefully and deliberately on the principle that it is easier to prevent damage than to get out when it is done. The dangers of the operation lie in injury to the pleural membrane, to the vertebral artery and to the intercostal nerve and the difficulties are associated with identification of the landmark of the first rib from the second rib and the seventh transverse process, haemorrhage and clearing and identifying the ganglia. On the right side two pieces of ganglion broke off during traction by the forceps holding the cervico-thoracic ganglion.

Craig also did a bilateral lumbar ganglionectomy and ramisection by the transperitoneal route which has been adopted in preference to the posterior approach.

The patient was a girl, aged fourteen, who nine months previously commenced to experience shooting pains in arms and legs; six months later the skin over these areas became glossy, followed by the development of cracks and stiffness of the skin—a condition of scleroderma, with limitation of movement of joints, especially of the legs. There had been rapid progression of these symptoms. The pain was diminishing (a characteristic of this condition, except in cold weather, when it increases). Physical examination revealed no abnormality except the tense skin which was dry, glossy and hard, especially in the legs. The Wassermann test gave no reaction and X ray examination of all limbs and joints revealed no abnormality. The vasomotor index of the left great toe was 18.3, of the right great toe 19.3.

This operation took two and a half hours under ether anaesthesia with the patient in the Trendelenburg position. On the right side the retroperitoneal space is opened by peritoneal incision and the *vena cava* is retracted, the psoas muscle and the genito-crural nerve are exposed by blunt dissection and the second to the fourth lumbar ganglia with their posterior routes are isolated and excised. On the left side peritoneum is incised lateral to the descending colon. Here some lymphatic glands were found enlarged as though by some inflammatory reaction and the second or third ganglion was much enlarged. I saw this girl two days later, when she was very bright and well and the skin felt less tense.

Rowntree, in discussing this case, remarked that improvement would be slow. The cervico-thoracic ganglia would be removed later.

I saw a little girl at Saint Mary's Hospital, aged eight years, whose history showed that at the age of eleven months the fourth left toe became red; four months later the left ankle and knee became involved and one year later the right knee. Recurrence occurred at irregular intervals. Four months before a cast had been applied to both knees with slight reduction in size. Examination showed that both knees and left ankle were swollen with limitation of movement. A radiogram of these areas revealed periaricular arthritis. The vasomotor index of the left index finger was 2.5, of the right great toe 1.3 and of the left ankle 4.0. The chart showed corresponding rises of temperature after serum infection.

The skin around the knees was shiny and a little thickened and flexion was limited to about 45°, but the child remarked that limitation of movement had increased since the legs were put in splints. She had very little pain and seemed happy. The feet appeared normal to me. This was, according to Rowntree, an early case which would inevitably get worse if ganglionectomy were not done, so the operation was performed next morning, the second to the fourth lumbar ganglia on each side being removed, together with the rami. The second and third ganglia on each side were fused together and there were signs of inflammatory reaction seen in the presence of enlarged lymphatic glands, easily mistaken for ganglia.

Adson discussed the operation with me before he left for New York and said that if the tests of vascular reaction are satisfactory, he is sure the treatment does good and gives results in the return of function and relief of pain. In the treatment of arthritis all measures for relief consist mainly of attempts to stimulate circulation in the affected part by dilating vessels, as for example in the application of heat. Sympathectomy does the same thing, but permanently or at least for a prolonged period extending up to three years in his first case, the temperature of the tissues being raised 3° to 6° F. The operation, he said, is indicated in cold, fishy conditions of the limbs. He is not satisfied that Royle's ramisection or Leriche's periarterial sympathectomy is complete enough, sympathetic distribution not being wholly perivascular, but having other paths.

Rowntree, in endeavouring to give relief to a woman, a hopeless sufferer from arthritis, who implored that something more might be done for her, reasoned that all treatment for this condition is aimed at improving the local circulation by heating the part and concluded that ganglionectomy might permanently effect this. So a bilateral lumbar ganglionectomy was done and in three weeks there was complete relief of the lower extremity. The patient returned some two years later, having

remained "cosy" from the waist down, and asked for an operation to cure the upper limbs likewise. Thoracic ganglionectomy was done with very great but not complete relief.

I saw a number of patients on whom the operation had been done at varying intervals: A female, ill eleven years and bedridden, now walking and free from pain; a girl, ill six years, now dancing; a man with twelve years' history relieved, but the operation a partial failure; a woman whose arthritis followed influenza ten years ago, cured in six weeks.

A doctor from Ohio, thirty-five years old, with three years' history of pain and limitation of movement of the lower limbs, had been operated on. I saw him in bed four days after his operation, when he could flex and extend his knees, hips and ankles and was free from pain. Four days later I saw him again and he could move his legs much more freely, but he had some pain in the knees, though none in ankles or feet.

Rowntree said this progressive improvement is typical.

Another doctor whom I saw on two occasions, had a two years' history with twelve months in bed. On the seventh day after operation he had good movement in the ankles and knees and was tender only over the posterior tibial artery, being absolutely free from arthritic pain since the operation.

I saw also a woman of thirty who had had the cold blue hands and painful extremities of Raynaud's disease and on whom a bilateral cervical ganglionectomy was done. During the operation the blue hands became pink and have remained pale and warm. The patient had no pain and expressed the greatest pleasure at the result of the operation.

There was also a woman of fifty with scleroderma whose skin was definitely loose following the operation.

These patients operated on were all suffering from borderline conditions in which every variety of medical treatment had failed to give relief or arrest the progress of the disease. The surgical relief is being tried by careful selection of patients and if the treatment proves effective, it should be a boon to the patients and their harassed physicians. Such patients as have been quoted are not met with frequently here, but do occasionally present themselves.

It may be worth while to go over our patients with uncured arthritis and see if some of them may not be amenable to ganglionectomy which apparently does no harm *per se*, for as Rowntree and Adson remark, it seems that in certain types of arthritis the sympathetic nervous system of the extremities is hyperactive, producing a definite vaso-motor disturbance and profuse sweating and possibly contributing to the spasm and atrophy of the muscles with resulting deformities.

Surgery of Goitre.

The prevalence of goitre in the United States of America was manifest by the large number of patients presenting themselves for treatment. At Rochester five patients were operated on in one afternoon, at Cleveland five in one morning and the same afternoon six were examined. At the Lahey Clinic hundreds of patients are treated in one year, at Baltimore a large group of patients were lined up with goitre and similarly at Barnes Hospital at St. Louis.

The work of American surgeons in goitre surgery is well known and the indications for operation and the technique are standardized. No new work was forthcoming, but the application of present day knowledge was well demonstrated. Preliminary treatment with Lugol's solution is universal and ligation of vessels and similar proceedings have been almost completely abandoned as a preparation for lobectomy. Repeated estimations of the basic metabolic rate are made as a routine preoperative procedure and Lahey in particular lays emphasis on the need for "follow-up" metabolic estimations to assess the results of treatment and the possible need for further surgery. The technical precautions during the operation aim at protection of the recurrent laryngeal nerve and of parathyreoid glands and the attainment of haemostasis. Besides careful ligation, haemostasis is furthered by suture of the lateral remnant to the trachea. The nerve is protected by leaving a strip of gland tissue over it, the remnant of gland left seeming to me to be frequently quite large and to be possibly sufficient to occasion a recurrence of symptoms of hyperthyroidism.

Dr. Crile commenced his enucleation of the thyreoid gland by separating its attachments to the larynx and the trachea and working outwards and downwards within the gland itself; he rolled it out of the deep recesses of the neck, thus avoiding the use of force by finger elevation of the gland. He regards the posterior margin of the thyreoid as "no man's land" which must not be palpated even, so avoiding any scar tissue which may interfere with nerve function.

By using local anaesthesia and light analgesia and by the use of nitrous oxide or ethylene the integrity of the nerve on the side first operated on is established; this is also done by inducing the patient to talk or cough before the second side is operated on. Dr. Crile kept up a constant conversation with some of his patients while he was operating; one was an excitable South American, who knew no English and spoke through the aid of an interpreter who stood by during the operation.

The functioning of both recurrent nerves is tested prior to operation, but Lahey who has seen occasional unilateral paralysis, states that this causes little difficulty. He has had occasion to deal with five cases of bilateral paralysis following thyroideectomy done elsewhere. In one instance he successfully united the ends of the nerves on the right side, with return of function. He showed me one patient with bilateral paralysis on whom he had done the operation of tracheotomy, this being the only measure to give respiratory relief where nerve anastomosis is not possible.

While avoidance of injury to the parathyreoid bodies is regarded as an essential in thyroideectomy, no measures to expose them were apparent. Lahey carefully examines the excised tissue under aseptic precautions at the time of operation and immediately transplants the parathyroids when they are found. A thin section is removed for microscopical

verification and the remainder is transplanted into the sterno-mastoid muscle. In one operation which I saw him do, Lahey removed a small discrete piece of tissue from the surface of the excised gland which he said might be a parathyreoid, and placed it in the sterno-mastoid muscle. Drainage is instituted only to provide for postoperative oozing of blood and as a protection against infection and not to take care of thyroid reactions. Indeed Lahey has dispensed with drainage in 80% of his thyroidectomies. Where a drain is left, it is brought out laterally through the ribbon muscles or if necessary through the sterno-mastoid and never through the centre of the incision, disfiguring adhesions of the scar to the trachea being thus avoided. Preoperative measures, principles of technique and postoperative care are standardized and only differences in technical details of operating mark the work of different surgeons. The care that is taken in preoperative diagnosis, was illustrated by a patient seen with Dr. Crile. The patient's condition seemed typical, but he was referred for further examination of the basal metabolic rate and chest radiograms to exclude pulmonary tuberculosis. This condition, especially if the thyroid is enlarged, with the tachycardia and weight loss may easily be confused with mild hyperthyroidism. Crile remarked that he had handled some 20,000 patients with thyroid disease, had made all the mistakes possible, had done much to teach the medical world how to avoid these errors and declined to be caught making any more himself.

The work of these thyroid surgeons demonstrated the great experience, careful research and technical skill which are devoted to this subject, and which by the intelligent application of recent knowledge have reduced the operative mortality to about 0.7%.

Surgery of the Lung.

The practical clinical advantage to be obtained by the devotion of competent workers to special fields is well shown in the surgery of the lung. Archibald at Montreal, Hedblom at Chicago, Harrington at Rochester and Graham and Singer in the Chest Clinic at Barnes Hospital, St. Louis, are amongst the leaders in this field. The technique of pulmonary surgery has been perfected in the balanced operation, only so much being done as the patient is able to tolerate. Harrington, for instance, in doing thoracoplasty aims at doing as much as possible in half an hour and then postponing further operation. Graham in his cautery operation in suppurative lung conditions makes repeated attacks with his soldering iron. By thus minimizing operation shock and haemorrhage and by proper pre-operative selection of cases, so ably stressed by Archibald, the operative mortality has been reduced considerably and lung surgery is now relatively a safe procedure.

A well organized chest department exists at Barnes Hospital, St. Louis, with collaboration between Professor Evarts Graham and Dr. Singer

as surgeon and physician. Radiological diagnosis at this clinic is very well done, Singer taking and interpreting his own radiograms from all sorts of positions, "Lipiodol," introduced by simple aspiration, being extensively used.

The surgical treatment of patients suffering from pulmonary tuberculosis is being applied with much success. The patients treated are mainly those whose conditions are regarded by physicians as hopeless without operation, and success is dependent on proper selection of patients for surgical compression therapy and the elimination of those factors which increase operative mortality.

Archibald, of Montreal, who has been doing this work since 1912, recognizes three main groups of conditions in considering the selection of patients for surgery, embracing those with unilateral disease, those with pneumothorax and those with empyema. It may be worth while to state briefly his classification. Good resistance as indicated by the degree of fibrosis is the keynote in selection.

The first group comprises those with chronic lesions whose general condition is good, whose lesions are unilateral or chiefly unilateral, and who usually have cavities with fibrotic changes pulling the trachea, upper mediastinum and base of the heart across to the affected side, and who have narrowed and insunken intercostal spaces. With failure of other forms of treatment, operation is unhesitatingly to be advised with good prognosis.

The second group comprises patients with chronic lesions whose general condition is deteriorating, but whose operative diagnosis is conditionally favourable.

The third group comprises patients with severe chronic and steadily advancing disease, though apparently fairly well limited to one lung; operation is still advisable, as a few do very well and the majority show a definite improvement.

The fourth group comprises unilateral disease with excessive cavitation and fibrosis in which it is useless to operate.

The fifth group includes the type with a fairly large cavity narrowly limited to the apex of the lung and with adherent pleura, in which a limited thoracoplasty is indicated.

The sixth group includes patients with the disease limited to the lower lobe, for which phrenicotomy or thoracoplasty of the lower ribs is advisable.

The seventh group includes patients with signs of trouble in the good lung: (i) Those with bilateral apical disease, treated by apicectomy first on one side, then on the other some months later. (ii) Those with recent activity in the good lung which has become quiescent or has largely cleaned up. In these one should begin with a test phrenicotomy and then only after waiting for six months. (iii) Those with known areas of activity in the good lung. Thoracoplasty should not be done in these circumstances, as the patient is in a stage of poor resistance. At most a test phrenicotomy should be done.

The eighth group includes patients in whom pneumothorax, spontaneous or artificial, has been maintained or induced. If the condition is early and active and good resistance has been secured, the patient may be left alone, but if it is a chronic condition with intercurrent acute spread or a simple, quiet advance of the lesions, especially cavitation, there is fear of a rupture of the cavity into the artificial pneumothorax and of empyema, especially if the cavity is uncomressed. For this condition thoracoplasty is advisable.

The ninth group includes patients with fairly good collapse from pneumothorax, but with band adhesions which hold out parts of the lung, and if the adhesion as seen by radiogram draws into its base a cavity, there is a danger of later empyema and it is advisable to give up the pneumothorax and substitute a thoracoplasty. Otherwise the adhesions should be divided.

The tenth group comprises patients whose pneumothorax is complicated by fluid which resists absorption and which persists after several aspirations. For these total thoracoplasty is advisable, even if the fluid is serous and certainly if frank pus is present, rather than aspiration and irrigation or if the patient is very ill after a preliminary drainage, provided the patient's condition improves enough for thoracoplasty.

The dangers incident to the operation of thoracoplasty were discussed at a session of the Clinical Congress of the American College of Surgeons by Archibald, Hedblom and Bettmann and the former quoted some illuminating figures and stressed the need for the constant cooperation of the internist and the radiographer. Apart from the refusal to operate on definitely unfavourable patients with poor resistance, the danger of producing paradoxical respiration was pointed out, with the need for removing not more than four or five ribs at a time, starting at the tenth rib. Archibald will never operate if the trachea is still on the mid-line.

I went on to Montreal and Dr. Archibald very kindly showed me his technique of thoracoplasty and phrenicotomy and I also saw Bethune, his assistant, do a thoracoplasty. Great pains are taken in posturing the patient on the operating table. Gas and oxygen anaesthesia is used with intercostal nerve block with "Novocain." Archibald removed portions of the upper four ribs in a final stage operation, Bethune removing the seventh to eleventh in a first stage. In the lower ribs as much as fifteen centimetres (six inches) of bone are removed, the upper ribs less, only 3.75 to 5.0 centimetres (one and a half to two inches) of the first rib being resected.

At Rochester I had seen Harrington do thoracoplasty for chronic empyema and he demonstrated a number of patients on whom the operation had been performed for suppurative and tuberculous conditions of the lung. With due regard to the principles laid down by experienced operators, the surgery of

pulmonary tuberculosis is becoming established as a further avenue of hope for some otherwise hopelessly disabled people.

Surgery of the Abdomen and Gastro-Intestinal Tract.

While not able to spend much time on surgery of the gastro-intestinal tract, I had opportunities for some study of it at the Mayo Clinic, the Cleveland Clinic, the Lahey Clinic, Boston and the Lakenau Hospital at Philadelphia. I was primarily interested in the type of anaesthesia used for these operations. In spite of many deaths, I found that surgeons tended to favour the use of spinal anaesthesia for all abdominal and pelvic work, and although the anaesthesia was not always perfect from the patient's point of view, the surgeon worked in greater comfort. At the Mayo Clinic I saw in use a new general anaesthetic, sodium iso-amyl-ethyl barbiturate ("Sodium amyral") which is given intravenously. C. H. Mayo and D. C. Balfour, especially the latter, were enthusiastic with regard to it and Balfour stated that he preferred "Sodium amyral" to all other anaesthetics.

Like spinal anaesthesia, the narcosis of "Sodium amyral" was such that there was no difficulty with straining muscles and bulging intestines, the anaesthesia being even right through the operation, the induction being quick, quiet and devoid of excitement. There is an absence of postoperative headache and vomiting. Several operations on the stomach were performed safely and with a minimum of bother. I saw it used also in breast amputations.

There is no need to comment on the excellent technique and masterly surgery of Mayo and Balfour whose work is so well known. It was a great privilege to see them at work. At the Mayo Clinic all patients with disease of the colon are grouped into a single division. Stress is laid on the importance of preoperative preparation of the patient. This includes thorough cleansing of the bowel and administration of foods which have a minimum of residue and which may be stored for reserve. The diet consists of a basic allowance of two thousand calories of carbohydrate, including sweets and fruit juices, and to which either more carbohydrate or some protein is added according to sugar tolerance. A recent interesting preoperative measure is the attempt to immunize the patient against peritonitis by intraperitoneal vaccination with a mixed culture of colon bacilli and streptococci isolated from the heart blood of animals that have died of peritonitis. Excellent results are claimed from this procedure. One cubic centimetre containing two hundred and fifty million organisms is given subcutaneously one week before operation. If no unusual reaction occurs, a one thousand million dose in ten cubic centimetres of normal saline solution is given intraperitoneally the next day and a similar dose two days later. After two days' rest operation is performed. Rather severe reactions follow this prophylactic treatment, subsiding in twelve to twenty-four hours.

I saw F. J. Rankin perform an excision of the rectum by the posterior route under sacral block anaesthesia on a patient who had this preliminary treatment. The patient, a nervous woman, stood the operation well, making a little complaint only when the peritoneum was opened and the sigmoid dragged down. The operation was skilfully and quickly done by the usual method, the incision encircling the sutured anus, the coccyx was removed and the sacral and superior haemorrhoidal arteries carefully ligated, there being very little haemorrhage. Rankin also performed the operation of ileostomy for a patient suffering from stricture of the sigmoid colon, resulting from recurrent attacks of ulcerative colitis. This rare complication appears only in about 2% of the two or three hundred patients with ulcerative colitis who are treated at the clinic each year, while about 10% show the presence of polyposis.

Dr. Jones, Proctologist at the Cleveland Clinic, operates on rectal carcinoma in one stage, claiming better results than he obtained by a two-stage operation with preliminary colostomy. His technique is briefly to make a long mid-line incision and a thorough exploration of abdominal organs. The rectum is mobilized and divided, the ends being covered with rubber dam tied on, after preliminary ligation of the inferior mesenteric artery to control all bleeding except from one or two small branches of the inferior haemorrhoidal artery. The rectosigmoid is removed down to the peritoneum, muscles are divided and complete blunt dissection of the hollow of the sacrum is done. The loose bowel is tucked down into the pelvis, the peritoneum is sutured and a left iliac colostomy is made. After the position of the patient is changed, the perineum is opened and the rectum removed, the cavity being packed with rubber dam and gauze. Thirty-five patients up to the age of seventy-seven years have been operated on with three deaths, including two patients with avoidable obstructions, and no recurrences have been reported. I saw one man of sixty-four who had been operated on five months previously, in whom no recurrence was observed, and who kept himself in perfect comfort by flushing the bowel through a flanged rubber tube once daily; he wore only a gauze pad on the colostomy opening during the day.

H. Bowing who is in charge of radium therapy at the Mayo Clinic, told me that patients with rectal cancer are being cured by radium if treated early enough and he cited one eight-year cure in a man without a colostomy operation being performed.

Surgical research work was impressive and I should like to give some account of it, if time and space permitted. With rich facilities, abundant material and keen enthusiasm, a great deal of research work is being done and in the laboratories which I was privileged to visit, this seemed to be guided by truly scientific methods.

Reports of Cases.

STREPTOCOCCAL MENINGITIS WITH RECOVERY.

By G. H. SOLOMON, M.B., B.S. (Adelaide),
Adelaide.

H.L., AGED three and a half years, was admitted to the Adelaide Children's Hospital on January 11, 1930, with the following history.

He was apparently in good health until three days before admission when, while running, he fell and ran the end of a brass curtain pole into his mouth and "against the back of his throat," causing profuse bleeding from the mouth. Since then he had been drowsy, irritable and refused food. For two days his parents had noticed that his neck was stiff.

On examination his temperature was 38.1° C. (100.6° F.), his pulse rate was 140 and his respirations numbered 44 in the minute.

He was a small boy with flushed face and grunting respiration, lying propped up in bed. There was some retraction of the head. His pupils were equal and reacted to light and accommodation. There was no squint or nystagmus. His fundi were normal. There was a patch of herpes on the lower lip. His tongue was thickly coated, his tonsils were large. The larynx and throat, examined with a laryngoscope, revealed no sign of recent trauma. His neck was very rigid. No abnormality was detected in the heart. On examination of the lungs some diminution of breath sounds was heard and a slightly impaired percussion note was found at the right base. The abdominal reflexes were not obtained. His knee jerks were sluggish. The ankle jerks were active and equal; the plantar reflex was flexor. Kernig's sign was present on the right side.

Lumbar puncture was performed and very turbid fluid under increased pressure was obtained. Laboratory examination of the fluid revealed great increase of cells which were mainly polymorphonuclear cells; the chlorides were 720 milligrammes per hundred cubic centimetres; sugar was present; globulin was not increased; no organisms were found in a direct film.

The next morning his chest was clear. Lumbar puncture was repeated and fifteen cubic centimetres of turbid fluid were withdrawn, the increase of pressure being very slight. Ten cubic centimetres of antimentingococcal serum were injected intrathecally. A chain of streptococci was seen in a direct film from this fluid and culture of fluid from the previous puncture yielded streptococci.

His subsequent progress was as follows.

On January 13, 1930, the temperature had fallen to 37.2° C. (99° F.). He was given ten cubic centimetres of antistreptococcal serum (Commonwealth Serum Laboratories) by intramuscular injection.

On January 14, 1930, his condition was improving. On lumbar puncture the fluid was definitely less turbid, but under greater pressure. Fifteen cubic centimetres of antistreptococcal serum were given intrathecally and fifteen cubic centimetres were given by intramuscular injection.

On January 15, 1930, the temperature was normal. He was moving his neck voluntarily. The cerebro-spinal fluid was nearly clear, but there was still an increase of polymorphonuclear cells. The fluid was sterile on incubation. Fifteen cubic centimetres of antistreptococcal serum were given intrathecally and fifteen cubic centimetres were given by intramuscular injection. He had developed a superficial infective condition of a finger. This was incised in several places and fomented.

On January 16, 1930, the temperature was still normal. The chin nearly touched his chest. On lumbar puncture sterile cerebro-spinal fluid was obtained. The white cells were still increased, but nearly all were mononuclear cells. No serum was given.

Lumbar puncture was performed on the following two days, the fluid being on each occasion quite clear. He was now moving his neck quite freely and his chin would touch his chest.

From this time onwards his improvement was progressive and without incident, except that on February 2, 1930, his temperature rose to 38.1° C. (101.6° F.) and he developed a generalized erythematous rash which was diagnosed by the Honorary Dermatologist as a toxic erythema. This faded completely and his temperature became normal again in less than a week. He was discharged from hospital on February 12, 1930, having made an apparently complete recovery.

Acknowledgement.

My thanks are due to Dr. E. Britten Jones, Honorary Physician to the Adelaide Children's Hospital, for permission to publish the case.

Reviews.

LIFE ASSURANCE EXAMINATIONS.

THE literature in English concerning the medical examination in life assurance is happily not very voluminous. But it may be said that such as exists is as a rule good and practical. This obtains because these books have been written by men with large practical experience in their subject and are not, as is too often the case, mere compilations produced by people of no great personal knowledge, but who have written just for the sake of writing. Dr. Paterson McLaren's work¹ is full of common sense and practical advice in the examination of proponents and the assessment of risks. Also, and this is a strong point in its favour, the author does not try to make his treatise an incomplete "tabloid" text book of clinical diagnosis, a pitfall indeed which one of the best books of recent years on this subject exemplified in no small degree. If examiners need instruction in the elements of physical diagnosis, then they are not fit to examine proponents for life assurance. On the whole this book has so many good points that it is a pleasure to state that at the moment it seems to be the best presentation of the subject in our language.

In a brief review it is utterly impossible to deal adequately with the many excellencies or at times to differ from the author in points of practice. Indeed in the discussion of a work so good all round criticism is happily a short matter. In all the chief questions of appreciation and assessment which are daily matters in life assurance, such as cardiac abnormalities, albuminuria and glycosuria, grave or otherwise, the author's advice is in keeping with the latest and, let us hope, the most correct views on these subjects. Perhaps rather more special insistence ought to have been laid on the value of exercise tolerance in heart examinations. We approve of Dr. McLaren's attitude in regarding certain groups generally as "doubtful lives," namely: (i) Persons over forty years of age with any kind of cardiac murmur, (ii) persons with any loud murmur or thrill anywhere, (iii) those with any diastolic or presystolic murmur, however slight. Especially should the last group be regarded with suspicion.

In the discussion on glycosuria and blood sugar tests the insertion of graphs would have been an advantage. Perhaps the author is a little too positive and lenient in his attitude to patients with so-called "renal diabetes" (a bad term) for, after all, such a condition is an "abnormality" and we do not yet quite know what is the late after history of such patients. In Sydney it has been found that in not a very few instances the histories of the so-called renal diabetics reveal the presence of true diabetes as a cause of death in one or other of their near relatives. Albuminuria is dealt with well and the author's summary is full of common sense. In a later edition we should like to hear more of renal efficiency tests and possibly some statistics of the fate of so-called functional albuminurias. The chapter on blood pressure is sane and well balanced. Here in Australia our view of high systolic

pressures, as set forth by British and American statistics, is modified by the fact that in proponents over forty the systolic blood pressure is quite often ten to twelve millimetres above the lower figures considered normal in other lands. For some reasons the pressure is often raised in otherwise absolutely normal persons.

It jars a little to find the author using expressions which no doubt are often in our mouths in careless speech, but which might have well been omitted in so admirable a work as this of Dr. McLaren. "Up to us" could surely have been otherwise expressed; "backyeld" is too local a word for so cosmopolitan a work; "tabagism" is surely an unlovely and needless term for the evil effects of smoking. However, let us be appeased a little, for our author does not forget to refer to the lessened tolerance for tobacco in later life, although he is a little too easily convinced of its comparative innocence in causing cardiac disturbances. With some few faults in style and still fewer in matters of moment, this book may be confidently recommended to the profession as the most useful hand book on life assurance at present published. It has deservedly passed into its second edition.

THE OVARY AND ITS SECRETIONS.

FROM time to time it is a salutary thing to take stock of the progress of science and research so that from the welter of hypotheses and theories unproven some facts may emerge as definite contributions to the progress of medicine. This in effect is the great value of A. S. Parkes's monograph, "The Internal Secretions of the Ovary."¹

Upon this subject a vast amount of work has been done in the last twenty years and the completeness of Parkes's review of this can be estimated from the bibliography of his book which contains no less than 661 references. Much of the research work resembles a disorderly and undisciplined soldiery from which the author has successfully paraded some very efficient platoons of sound deduction.

He presents the question of female sexual periodicity and the oestrous cycle in two well written chapters embellished with adequate illustrations and graphs. He discusses the origin of the oestrous-producing hormone, "oestrin," the history of its preparation, chemical properties and action upon animals deprived of their ovaries and normal animals.

The standardization of ovarian hormone by the vaginal smear technique of Allen and Doisy is dealt with in a comprehensive manner.

Not the least interesting chapters are those that deal with the interrelationship between the anterior lobe of the pituitary and ovarian function. The well proven influence of the anterior pituitary upon the production of lutein material in the ovary is expounded in lucid and interesting passages, these little known phenomena being given more, but none the less due, prominence than is usual in literature of this kind.

The hormone of the *corpus luteum*, its effect upon uterine sensitization and endometrial growth, is considered in relationship to its possible influence upon the maintenance of uninterrupted pregnancy.

Lastly, the initiation of parturition at the tenth menstrual epoch is discussed in a chapter in which the author gives adequate consideration to the theory of Dixon and Marshall that a progressively increasing output of oxytocic secretion from the posterior pituitary is stimulated by an ovarian hormone which is restrained or antagonized in the earlier months of gestation by an endocrine product of the *corpus luteum*. It is, however, further pointed out that the explanation may be found in a sensitization of the uterine muscle to the normal post-pituitary output.

This book, interesting to all medical men, especially so to gynaecologists, is of real value to laboratory and research workers by reason of its concise clarity and the wide extent of its survey of the literature.

¹ "Medical Insurance Examination: Modern Methods and Rating of Lives," by J. Paterson McLaren; Second Edition; 1929. London: Baillière, Tindall and Cox. Demy 8vo., pp. 661. Price: 30s. net.

¹ "The Internal Secretions of the Ovary," by A. S. Parkes, M.A. (Cantab.), Ph.D. (Manch.), D.Sc. (London); 1929. London: Longmans, Green and Company. Demy 8vo., pp. 257, with illustrations.

The Medical Journal of Australia

SATURDAY, MAY 17, 1930.

Medical Certificates.

ALTHOUGH the responsibilities of the medical practitioner may be viewed from several aspects, they are essentially the same in all types of medical practice. The medical practitioner acting as an officer of one of the public services frequently has to do with large bodies of men and women both in their illnesses, their work and their recreation. He has to do with the prevention and detection of disease in the community. The medical practitioner in private practice is concerned with the persons who consult him and with others in contact with them. His work is of a more individual nature than that of, for example, the public health administrator. He is, nevertheless, concerned with prevention as well as with the treatment of disease. In every branch of medical practice the medical practitioner is called upon to give certificates, either of the presence of illness, freedom from disease, ability to resume work and so forth.

It should be unnecessary to point out that the first essential for the giving of certificates is a knowledge of the normal anatomy and physiology of the organ or organs affected by a given disease process, of the varied manifestations of the disease and of their effect on normal function. It is also necessary that the medical practitioner should know something of the psychology of the type of person with whom he is dealing. The third essential is the honest intention of the medical practitioner. In other words, the essentials are those of everyday medical practice. The medical practitioner must at all times bear in mind the object for which the certificate is sought. His certificate is usually based on his opinion in regard to certain observations made by him. It is different from a certificate authorized by law. A certificate of the latter variety has an official character and is accepted as evidence

in a court of law. Examples of this type of certificate are certificates of the discharge of a bankrupt or of the appointment of a person as administrator of the estate of a deceased person or of the registration of a ship. Since a medical certificate is based on opinion made from certain observations, it behoves medical practitioners to be most punctilious and cautious in issuing them, for their value is in actual fact the reflex of the integrity of the person from whom they are issued. The certificate of a man known to be given to equivocation, will be accepted at its true worth. Medical certificates are usually demanded that they may serve as a basis for the adjustment or assessment of time given to work, of services rendered or of moneys earned. They may be sought by employer or employee, by friendly society lodge, insurance company or patient. If the medical practitioner is acting for one party to a contract, he must endeavour to be just. His sympathies must have no part in the formation of views expressed by him—his statements must be made in good faith. With the best of intentions he may sometimes give an untrue certificate, for the patient may wilfully mislead him; the malingerer cannot always be unmasked.

Since the introduction of the several Workmen's Compensation Acts in the States of the Commonwealth, medical certification has become more frequent. The medical practitioner not unnaturally wishes to make the task of the patient as light as possible and to save him unnecessary journeyings. In this way a most undesirable form of practice has arisen in the post-dating of certificates. For example, a medical practitioner gives a certificate on April 20, stating that the patient "is now able to resume work," and he dates the certificate April 25. By this certificate the medical practitioner implies that he has seen the patient on April 25. The patient perhaps goes to work on April 22. The proper method of certification would be by a certificate, dated April 20, as follows: "In my opinion Mr. X will be able to resume work on April 25." On a post-dated certificate the onus would be on the medical practitioner to prove that his certificate was not wilfully misleading. In this connexion it is well to remember the warning notice of the

General Medical Council of Great Britain: "Any registered practitioner who shall be shown to have signed or given under his name and authority any such certificate, notification, report or document of a kindred character which is untrue, misleading or improper, whether relating to the several matters above specified or otherwise, is liable to have his name erased from the Medical Register." Medical practitioners are urged to keep this matter continually before them. They must above all things be careful to avoid doing anything that will justify the reproach that they are prepared to sell their birthright for "a mess of pottage."

Current Comment.

EPILEPSY.

THE symptoms of epilepsy have been known since the time of Hippocrates. Different types of epilepsy have been distinguished during recent years and hence it has become more usual to speak of "the epilepsies." Pyknolepsy is a curious form of minor epilepsy occurring in children between the ages of four and twelve years. It consists of numerous slight attacks occurring daily for weeks, months or even years. The number of seizures varies from six even up to one hundred or more daily. They resemble *petit mal* and are resistant to treatment, but the outlook is favourable and they cease spontaneously, leaving no trace at or after puberty. In myoclonus epilepsy simple muscular twitchings occur from time to time without any other mental or bodily disturbance apart from the epileptic seizures. Collier in 1924 observed that exogenous poisons (lead, bismuth and absinthe) and metabolic dyscrasias (as in rickets, renal and hepatic disease, puerperal eclampsia and thyreoid and pituitary disease) produce symptoms like epilepsy. These suggest that the cause of epilepsy is a metabolic disturbance, not a condition of cerebral irritability or instability. The periodicity of the fits is in favour of a metabolic disorder. The *status epilepticus* is best explained as an acute toxic process. Miller in 1924 emphasized the hypothesis that epilepsy, like migraine, may be a sensitization disease; he cited the occasional efficacy of protein therapy. After antitoxin treatment for diphtheria the fits have temporarily disappeared. The injections of normal horse serum, peptone solution and tuberculin have also given encouraging results. If the epileptic seizure be an anaphylactic manifestation, the question of specific desensitization becomes of practical importance.

Dr. Philippe Pagniez in his book "L'Epilepsie" (1929) points out that metabolic abnormalities, very diverse in kind, have been described in epileptics

and in some patients anaphylaxis may precipitate the fits. He claims to have demonstrated that the blood serum of epileptics may produce convulsive phenomena in guinea-pigs when injected into the carotid artery and that the toxicity of the serum increases and diminishes according to the relationship of the time of its withdrawal and the occurrence of fits in the patient. Pagniez holds that there is little evidence of endocrine disorder having any aetiological bearing. The part played by heredity in determining epilepsy has been differently estimated by various observers. The nature of neuropathic symptoms in relatives or ancestors is not easy to establish. Russell Brain in 1926 in a series of epileptics found a family history in 28%, as compared with less than 10% in a control series. Others give a still higher percentage of hereditary transmission. The incidence of insanity amongst relatives of epileptics was found by Brain to be no higher than in the general population. Purves-Stewart (1928) observed that the phenomena of the epileptic aura corroborate the view that the manifestations of epilepsy must be essentially cortical or transcortical in site; they cannot be infracortical. An aura is an hallucination—a sensation referred by the patient to some part of the body or limbs or to the special senses. It is a psychical phenomenon. As to what precipitates a seizure, he is of opinion that there may be an inherently predisposed irritability of the cerebral cortex.

M. G. Peterman in 1927 published his observations on the effect of a ketogenic diet in epileptic children, recalling the fact that starvation often causes cessation of the fits. The changes noted in the blood chemistry during fasting include a definite increase in ketone bodies. Assuming that ketosis and a tendency to acidosis, induced by starvation, are the efficient factors in controlling the fits, Peterman tried a ketogenic diet and claimed successful results. Helmholtz for five years carried out similar observations and claimed that the ketogenic diet gave striking results from the first, 54% of patients being definitely benefited.

Irvine McQuarrie, assisted by Clara M. Husted, of Rochester, has made investigations as to the relationship of water balance to the occurrence of epileptic seizures in children.¹ He states that the major portion of the decrease in body weight during fasting is due to loss of water. Diets extremely low in carbohydrates and relatively high in fats have a similar dehydrating effect. A mild polyuria usually follows the seizure, extra water being excreted incidental to the removal by the kidneys of catabolites formed during the fit. McQuarrie advises limitation of fluid intake in patients who respond unsatisfactorily to ketogenic diet alone. Experiments were made to determine the relation of water balance to the occurrence of fits, the frequency and severity of convulsions being observed when children were placed on different levels of water intake. The effects of antidiuresis induced by

¹ American Journal of Diseases of Children, September, 1929.

pituitary solution or solution of the antidiuretic hormone of the hypophysis (β -hypophamine) were determined with water intake increased and restricted. The effectiveness of urea in removing excess water was tested. No sedative drugs were used. Experiments suggest the following tendencies: (i) An epileptic retains body water to an abnormal degree during the active phase of the disease. (ii) Seizures follow the accumulation of water beyond a certain point. (iii) Fits disappear after the removal of extra water by rigid fluid restriction. Unless the restriction be very stringent, initial control by this method alone in a severe case may need an extended period, apparently because of a strong tendency to retention. A regimen of fasting with rigid restriction of water intake is very effective in causing a negative water balance and cessation of fits. The procedure results in hyperthermia and rapid loss of weight which might be harmful if unduly prolonged. On an adequate borderline non-ketogenic diet water balance can be established at a level which will prevent seizures and be compatible with comfort and normal physiological activity. In the state of relatively low water intake body weight is increased and fits recur if β -hypophamine be given. Such retained water is removed and cessation of fits is likely to occur if large doses of urea be administered.

The four different regimens which favour the prevention of fits—fasting, restriction of fluid intake, ketogenic diet and exhibition of large doses of acid-forming salts—all have in common the effect of dehydrating the tissues. Administration of the antidiuretic hormone of the pituitary (not its pressor or oxytocic constituents) favours the occurrence of fits. Some surgeons believe that all epilepsy has an organic basis and that in most patients there is evidence of excessive accumulation of fluid in the central nervous system, especially in the subarachnoid spaces. Such patients would respond to dehydration. Most investigators, however, believe that there is a large group of young epileptics who manifest no primary structural changes in the brain or its coverings. The nature of the relationship of water balance to the fits is obscure. In attempting the explanation it must be remembered that no one cause can be postulated for every form of epilepsy. It is necessary to postulate a response on the part of a nerve cell which is in an abnormally irritable state, to either a normal or a pathological stimulus. Possibly the benefit induced by partial dehydration depends only on the mechanical relief from undue pressure within the fluid channels of the brain. The antidiuretic or hydrating hormone isolated by Kamm and his fellow workers from the posterior lobe of the *hypophysis cerebri* might, if overactive, be responsible for a tendency on the part of the body to retain excess of water. Or such an effect might result from under-production of a normally occurring antagonistic diuretic or dehydrating hormone. In the event of such hypoactivity it would not be necessary to assume more than normal activity of

the organ producing the hydrating principle. If it be granted that alteration in the water balance is a factor in some of the epilepsies, the question of treatment resolves itself into not only discovering the cause of the alteration, but also influencing the irritability of the cerebral cell. It might be possible to achieve at any rate a certain amount of success by treating the cerebral circulation so that noxious substances would not act upon it.

ABDOMINAL OPERATIONS AND RESPIRATION.

In spite of the advance of modern surgery pulmonary sequelæ in the form of embolism, thrombosis, collapse and inflammatory change are still to be feared. They are most commonly seen after abdominal operations. This is probably because (with the exception of inflammatory changes resulting from inhalation of infective material) there is a certain amount of interference with the movements of respiration as a result of the surgical trauma and because the blood and lymphatic circulations are so arranged that pulmonary infection can easily occur. D. H. Patey has recently investigated the effect of abdominal operations on the mechanism of respiration.¹ He has investigated the vital capacity before and after abdominal operations and also the tidal air before and after abdominal and non-abdominal operations. He has also investigated the movements of the diaphragm by means of X rays. He found that in practically all abdominal operations there was a deficiency of expansion of the lung bases and a certain amount of venous stasis as compared with the pre-operative state. He points out that neither the administration of carbon dioxide nor the use of morphine suffices to combat deficient diaphragmatic movement and he believes that the correction of this deficiency remains unsolved. He does not refer to the posturing of the patient so that intraabdominal pressure on the diaphragm may be reduced to a minimum. Since no collapse of the lung nor embolism occurred among his patients, he concludes that respiratory subefficiency is only a predisposing factor and that other factors of an exciting nature are necessary for the development of complications. This is probably correct. He believes that the special frequency of complications of this kind is due to mechanical causes; he admits that this assumption may be incorrect. He shows that intraabdominal pressure is not subject to the same variations after as before operation and that this by interfering with venous return by the inferior *vena cava* gives rise to a tendency to stasis. He emphasizes the importance of combating distension and of "splinting" the abdominal musculature and shows that theoretically abdominal massage would be useful. If he had thought of other than mechanical causes, he would have laid stress on gentle handling of tissues, avoidance of shock and rigid attention to asepsis.

¹ *The British Journal of Surgery*, January, 1930.

Abstracts from Current Medical Literature.

RADIOLOGY.

Osseous Dystrophies.

L. H. GARLAND (*American Journal of Roentgenology and Radium Therapy*, December, 1929) describes the osseous dystrophies, *osteitis fibrosa* and allied diseases of bone. These disorders are characterized by a softening, thickening and deformity of the bones appearing at dissimilar age periods and presenting variable clinical symptoms. The lesions are variously described as *osteitis fibrosa cystica*, bone cysts, *osteitis deformans* and giant cell tumours. It is now practically certain that the first three are merely types of the same disturbances. The aetiology of the group is unknown, though trauma, infection, endocrine disorders and nutritional errors have been postulated. One authority quoted appears to think the primary lesion is a dysfunctioning "osteone," an appellation based on the belief that the highest cell unit in the osseous system is as highly specialized as the highest cell type in the nervous system. Pathologically the four conditions appear definitely related, differing in degree only. A relation between rickets and osteomalacia with *osteitis fibrosa* is suggested by some authorities. *Osteitis fibrosa* or *osteodystrophy fibrosa* may be described as a disease in which localized patches of fibrous tissue, with or without cysts, occur in bones. Two main types are manifested: the localized type most often seen in youth and the generalized type occurring in elderly persons. The long bones and skull are the most frequent sites of the disease. *Osteitis fibrosa localisata* includes some so-called multilocular bone cysts and some types of epulis and *leontiasis ossea*. A differential diagnosis is given between the osseous dystrophies and the following conditions: giant cell tumour, chondroma, myxoma, sarcoma, myeloma, chronic osteomyelitis, tuberculosis, syphilis and parasitic bone cysts. To distinguish the solitary lesion from a giant cell tumour and sarcoma is the most serious problem.

Diagnosis of Jejunal and Ileal Conditions.

MAX RITVO (*American Journal of Roentgenology and Radium Therapy*, February, 1930) describes the Röntgen diagnosis of lesions of the jejunum and ileum. The lesions are rare and clinical diagnosis is difficult, except where there is obstruction. Röntgen examination is a great aid to diagnosis, helping to determine both the condition present and its situation. The Röntgen examination is usually made after barium sulphate meals. Normally the mixture begins to pass out of the stomach immediately and the small bowel commences to fill within a few minutes. The *valvula*

conniventes are seen as snow-flaky, feathery outlines. The ileum is smooth and sausage-like in appearance. The lesions of the small intestine which may be demonstrated are, obstructions (partial or complete), hypermotility, diverticula, malposition, adhesions, tuberculosis, ulcers, new growths, foreign bodies and post-operative changes. Obstructions may even be diagnosed without opaque meal, if the obstruction is accompanied by gas formation in the small bowel; such gas formation is always of pathological significance and indicates obstruction. The exact situation of the pathological process may not be demonstrable, but great assistance can be given to the surgeon by indicating in which region the best surgical approach may be made. Diagnosis by means of plain films without opaque meal is naturally much quicker than the latter method. Diverticula occur in two forms, the single pouch and the multiple type. Malpositions and displacements are common; tumours of the pancreas displace the jejunum downwards; those of the spleen towards the mid-line; renal tumours cause downward and outward displacement. Pelvic tumours are particularly easy to show and differential diagnosis between the pregnant uterus and many other pelvic tumours may be definitely established, especially by reexamination after an interval of one or two months. Abscesses either of the appendix or in the pelvis cause loops of small bowel to encircle the abscess in an attempt to wall it off. Adhesions may cause fixation, abnormalities of position and changes in the size and contour of the bowel. Tuberculosis and ulcers are very difficult to diagnose, whilst neoplasms are very rare. Foreign bodies are easily observed and their passage through the bowel checked by repeated examinations.

Cancer of the Oesophagus.

JOHN T. FARRELL, junior (*Radiology*, March, 1930), writing on Röntgen diagnosis of cancer of the oesophagus, states that although patients are presenting themselves for diagnosis of other cancers at a much earlier stage than formerly, this is not so with cancer of the oesophagus. One authority holds that the status of the diagnosis and treatment of oesophageal malignant disease is an indictment of modern medicine. Another authority believes that this is due partly to the medical practitioner and partly to the patient since both regard as trivial the initial symptom of difficulty in swallowing. Röntgenology offers the most universally practicable method for diagnosis, being simpler and more readily available than oesophagoscopy, though not so accurate. The opaque material is ingested as fluid, semi-solid or solid and the patient examined, both standing and lying. With the patient standing the left oblique position is used, but for examination in the horizontal plane the right oblique is more satisfactory. The

normal oesophagus is smooth and of an almost uniform width throughout, though four points of narrowing are anatomical: (i) at the *introitus*; (ii) where the oesophagus passes from the neck to the chest; (iii) at the crossing of the left bronchus near the aortic arch; (iv) at the *hiatus*. The normal oesophagus does not manifest peristalsis when the patient is examined in the erect posture with fluids, but gentle peristalsis is seen when semi-solid boli are given. In nervous individuals the mixture may run up and down the structure, a gurgulatory process. As in other hollow viscera, the filling defect is the sign of organic disease. Two structural changes automatically follow oesophageal obstruction: (i) narrowing at the point of obstruction; (ii) dilatation proximal to it. The filling defect and not the dilatation is the significant finding and many patients show only slight dilatation contrasting with the definite dilatation and increased peristalsis seen in benign obstructive lesions of long standing. Metastasis and pulmonary infections sometimes complicate oesophageal cancer. Enlargement of the mediastinal glands does not occur to any great extent and only rarely are nodules seen in the lungs. This tendency of the lesion to remain local and metastasize late gives some hope of cure if early diagnosis can be made. Aspiration infection in the lower lobes from overflow may complicate the disease and fistulous communication between the oesophagus and trachea or a bronchus, may follow erosion by the new growth. Organic conditions which must be distinguished from cancer, are cicatricial stenosis, stenosis from external pressure, oesophageal varix, oesophagitis, diverticulum, foreign body, oesophageal extension of gastric malignant disease. Phrenospasm, central nerve lesions and hysteria are the functional conditions with which malignant disease may be confused. In cicatricial stenosis the history is important and when it is known that an acid or a caustic has been swallowed, the diagnosis is readily made. The narrowed walls are usually smooth, the proximal dilatation varies and though more definite than in malignant disease it is never so great as in cardiospasm. Stenosis from external pressure may be due to aneurysm or mediastinal tumours which are easily recognized. Varix may cause filling defects similar to cancer and oesophagoscopy is the only method of differentiating the conditions. This is also true of oesophagitis. Diverticulum usually occurs in the upper third and is easily demonstrated. Foreign body is obvious if opaque, but if non-opaque more difficulty in diagnosis is encountered and it must be remembered that difficult swallowing of sudden onset may be caused by food caught at the site of malignant disease and this may be the first symptom of carcinoma. Phrenospasm is distinguished by its chronic course and patients usually come under observation at an

earlier age than those suffering from malignant disease. There is no filling defect, the oesophagus being smooth throughout and the lower end tapering to a point. Dilatation is frequently enormous and peristalsis vigorous.

PHYSICAL THERAPY.

Radiotherapy in Goitre.

A. LOREY (*Deutsche Medizinische Wochenschrift*, February 14, 1930) discusses the relative merits of surgery and radiotherapy in the treatment of hyperthyroidism. While admitting that surgery generally effects a cure, particularly in goitre resistant to X rays, he still is of the opinion that the latter is as a rule the better treatment. In its favour is the time element, especially for patients who must return to work quickly. It should be tried first of all in every goitre and no exact time limit can be given to mark the point at which active surgical measures should supplant it. He recommends that if no improvement is noted in four months, then surgery is indicated. Further experience is required as to the value of radium in place of X rays, not only for fresh goitres but with those which have proved resistant to the latter.

W. BREDNOW (*Münchener Medizinische Wochenschrift*, January 17, 1930) reviews his patients with exophthalmic goitre treated by X rays. The technique employed was as follows: Three milliamperes of current with 150 kilowatts, a 0.5 millimetre copper filter with 30 centimetre focal distance from the skin. Both lobes were treated by him on consecutive days. Radiation was repeated after eight days when the thymus field was occasionally included. Six weeks later a careful examination was made and if considered necessary another course was given at half the strength of the original dose. The larynx was carefully screened and no injuries were noted. Twenty-eight patients were treated; in 22% complete success was attained, 53% showed definite improvement and 25% were unaffected. The basal metabolic rate and the body weight were noted in every instance. Treatment was not considered successful unless the basal metabolic rate dropped to within 10% of normal, unless there was an increase in weight with a diminution in vaso-motor symptoms besides a complete physical feeling of well being.

Calibration of Bucky Grenzstrahlen Tubes.

L. E. JACOBSON in discussing the calibration of Bucky *Grenzstrahlen* tubes for therapy (*American Journal of Roentgenology*, December, 1929) states that each tube must be calibrated on that apparatus on which it is used in therapy. For complete

calibration for practical purposes, the following characteristics of the tube must be known. The quality of the *Grenzstrahlen* should be defined by the half-absorption value in aluminium. The intensity in Röntgen units per minute for each kilovoltage and each distance must be known. These data can be recorded on a curve in which distance is plotted against Röntgen units per minute for each kilovoltage. It is useful to prepare a table for each kilovoltage in which the time is indicated for a definite number of Röntgen units. The field should be mapped either in Röntgen units per minute or more easily by photographic means. For practical purposes the *Grenzstrahlen* chamber can be placed within the range of three to ten centimetres from the window of the tube in order to define the half-absorption value, provided the half-absorption value is about 0.04 millimetre of aluminium or less. By addition of correct thickness of aluminium the quality can be changed, that is, the half absorption value can be increased to the desired amount. *Grenzstrahlen* become hardened as the distance from the tube increases, as shown by the increase in the half-absorption value at 20 centimetres air distance over that at about four centimetres air distance. The higher the voltage, the greater the hardening. The same tube on two different apparatus may have different intensities even for the same quality of rays. Two tubes of the same construction, each being used on the same apparatus under the same conditions of voltage and amperage, may have quite different characteristics of quality and intensity. Curves are given which show the half-absorption value for different voltages, different tubes and different distances. Curves are given for a number of *Grenzstrahlen* tubes which show the variation in intensity, Röntgen units per minute, with distance for different voltages. Diagrams of the fields of *Grenzstrahlen* tubes are shown.

Thyreotoxicosis.

E. V. POWELL, in discussing the subject of irradiation therapy in thyrotoxicosis (*Radiological Review*, January, 1930), states that thyrotoxicosis should be treated symptomatically since knowledge of its aetiology is indefinite. All focal infections should be eradicated. Rest is most important. Efforts should be directed toward reducing the vascularity of or destroying the cells in the thyroid which produce the altered or excessive secretion chiefly responsible for the symptoms. This may be accomplished by surgery or radiation. Radiation produces an obliterative endarteritis of the arterioles and diminishes the calibre of the larger vessels. Hence, properly used, it should cure the pathological condition present without sacrificing the required amount of glandular elements. It can be used when the condition is inoperable, when operation has not been success-

ful, as well as when the condition is suitable for surgical treatment. Neither surgical operation nor radiation is 100% effective. Surgeons have operated on patients who have been subjected to irradiation treatment and radiologists have successfully treated patients unsuccessfully submitted to operation. The author asks what should be the attitude of the medical practitioner in referring to a specialist a patient with hyperthyroidism. If he decides for operation, he takes less risk if he refers the patient to a surgeon trained and competent to handle such patients. If he decides for irradiation, he should be equally careful to secure the services of a competent radiologist. It is essential to keep two things in mind: first, there is no mortality with irradiation treatment and second the end results are practically the same with either method.

Vitamin D.

D. J. BARNES discusses the comparative value of irradiated ergosterol and cod liver oil as a prophylactic antirachitic agent when given in equivalent dosage according to rat units of vitamin D (*American Journal of Diseases in Children*, January, 1930). He states that cod liver oil prevented or cured rickets in 95% of the patients studied when given in a dosage of three teaspoonsfuls daily (1,400 rat units of vitamin D). Considering the subjects who were normal or improved at the end of the experiment, 98% were either well or had received benefit. A mixture of cod liver oil plus irradiated ergosterol in a dosage of three teaspoonsfuls (3,750 rat units of vitamin D daily) prevented or cured rickets in 98% of the cases. There was no evidence of superiority among this group as compared with the group given cod liver oil. Irradiated ergosterol in a daily dosage of 1,250 rat units of vitamin D prevented or cured rickets in only 44% of the patients studied. The results in this group were not significantly better than those for the control group of untreated subjects. Cod liver oil in a dosage of 1,400 rat units of vitamin D per day was a much more satisfactory antirachitic agent than was the irradiated ergosterol in the approximately equivalent rat unit dosage. It would seem that it is not justifiable to consider rat units of vitamin D in irradiated ergosterol as being equivalent to the same number of rat units of vitamin D in cod liver oil as a curative or prophylactic remedy for rickets. There is no definite evidence of a greater incidence of rickets among formula-fed than among breast fed infants. There is evidence of a greater need for protection against rickets among the coloured infants, as is shown by the greater final incidence of rickets among these infants in the control series and in the group given irradiated ergosterol. It is also clear that these infants are protected successfully by a daily dose of three teaspoonsfuls of cod liver oil (1,400 rat units).

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Broughton Hall Psychiatric Clinic, Leichhardt, on April 10, 1930. The meeting took the form of a series of clinical demonstrations by members of the staff.

Post Encephalitic Parkinson Syndrome with Oculogyric Crises.

A female patient, aged thirty-three years, a married woman, had been admitted on February 24, 1930.

She had had a "nervous breakdown" four years previously, four months after the death of her baby. Two months before the breakdown she had noticed an intense sleepy feeling. This had lasted a week and she had continued to worry over her baby's death. For the past four years she had had attacks of dimness of vision and she would see "numerous white rings" and her eyes would twitch and finally turn up. At first these turns had been only occasional, but at the time of admission they occurred every three days. A glare precipitated an attack; she lay down and the attack passed off in a half-hour. If she kept on working, the twitching persisted until sleep supervened at night. She never got a headache and thought that excitement brought the turns on. Six months previously she had first noticed her right hand to be shaky, followed by the left hand, then the leg and body. She had noticed that her face developed a forced expression. She found it difficult to speak, certain syllables being difficult to pronounce. She had been very constipated, but for the last four months the bowels had been well open. She said that she saw everything double, when she had dimness of vision and the eyes went up; if she concentrated, these symptoms disappeared.

On admission she had had no psychotic symptoms, but had been miserable and worried about her illness. She was inclined to be somewhat petulant, restless and agitated.

Physical examination revealed a good physical condition. The extremities were tremulous. The arms were in fixed position, the elbow and wrist were flexed across the chest. There was loss of emotional expression; speech was indistinct. The pupils were equal, small, regular and reacted to light and accommodation. A fine tremor, aggravated by movement, was most marked in the right arm and leg. The tongue was tremulous. Rigidity was more pronounced on the right side. There was no marked weakness. The reflexes were exaggerated.

Post Encephalitic Parkinson Syndrome.

A female patient, aged forty-nine, was the wife of a miner. She had five children. Seven months previously the patient had begun to suffer with headaches which would gradually become intense, persist for a couple of days and then become less again. For seven days when the headache was intense she had become unconscious. She had been taken to the General Hospital, Newcastle, where she remained up to her admission to Broughton Hall. She had been told that at first she "used to sing and see things" but she could remember only the last weeks of her stay. She had been very sleepy; as she improved she had noticed that the headache had gone but that the legs began to jump and the arms to shake. The arms had felt weak and tired and the tongue thick.

The patient was quiet and amenable, she was able to give a relevant account of herself. She was rather tearful and miserable about her illness. She was elderly, well nourished and had a rather fixed expression. In the tongue a fine irregular tremor was present. The tremor was marked in the right arm and leg with increased tone and weakness. Slight tremor was present in the left arm and leg. The pupils were equal and reacted. The knee jerks were active. The cardiac response was clear. The systolic blood pressure was 150 and the diastolic pressure 120 millimetres of mercury. The day before the meeting the patient had complained of recurrence of head pains at the back of the head.

The illness of a male patient, aged forty years, had begun four years previously when he found he could not articulate correctly. His left hand had begun to shake and he had become increasingly drowsy. His neck had been stiff and he had found that his walking was affected and that he stumbled and if he walked too quickly he had experienced difficulty in stopping himself. About this time his right eye had "turned inwards" and had remained so.

He had been in the Royal Prince Alfred Hospital. His skull had been trephined and the cortex had been stimulated with electricity without definite result.

On examination the general systems were clear. There was loss of sensation on the left side of the face and neck. There was increased tonus of the left facial muscles and coarse involuntary tremor of the left arm and hand.

A male patient, aged forty-seven years, gave a history of encephalitis two years previously. Since then he had been out of work. For the past eight months he had felt languid and tired and had felt unable to meet people, believing that they would notice his condition and suspecting that they talked about him. He had been mildly depressed because of his troubles.

On examination he had a rather expressionless facies with a wide palpebral fissure. Speech was slow with slight impairment. Fine tremor of the fingers was present. The reflexes were exaggerated. The other systems were clear. The interesting feature was the neurasthenic onset.

A male patient, aged forty-three years, a harness maker, gave a history that five years previously he had suddenly had a fit, followed in a week by another; these had lasted about an hour in each instance. He had become tired and languid and had been unable to follow his occupation. Two months later his head had become "numb." This state of affairs had persisted on and off until two years previously when his speech had become affected; he had found it difficult to commence his sentences. His arms and legs had then become stiff and his movements slow and he had dropped articles. The neck had then become stiff and bent forwards. For two years he had noticed that his expression was strained and the eyes staring. A year previously a fine rapid tremor had developed which lasted only four or five months. Lately his eyesight had become blurred. He felt quite contented, but for the first two years had been worried over family affairs.

On examination he had an expressionless, mask-like facies and wide palpebral fissure. Speech was slow and halting, he found it difficult to commence a sentence. He had no noticeable tremor. All his reflexes were exaggerated, except the knee jerks.

The other systems were clear.

Intestinal Neurosis.

A female patient, aged thirty-four, the wife of a salesman, had been admitted on February 13, 1930. Three years previously she had had a "nervous breakdown." She had had a screaming attack at a picture show. Later she had had a "turn." She did not remember what happened during this turn, but it had started with palpitation and a choking sensation and everything before her eyes had gone black; rapid respiration and trembling had been present. Her neck was red and flushed. The "turn" lasted about twenty minutes usually, but if she was excited or overtired, it might last much longer. These turns at first had been occasional, now they occurred almost every day. Following a turn or fit she had severe headache, felt languid and tired and when she walked her leg seemed to tremble and she felt as though she was staggering. Her fingers seemed to get numb and she often dropped articles. She became very depressed; she suffered from weeping turns and felt she could not associate with any one. Work seemed an effort and she became very exhausted and tremulous and had to rest frequently. She could not concentrate on anything, for example, reading or sewing. Severe headaches worried her almost constantly; these affected her whole system. Since admission the taking of food caused a sensation of nausea followed by vomiting. In a "turn" she trembled all over, she would not speak, but did not lose consciousness. She had frequent weeping spells.

On admission she had lain in bed quietly and was amenable. She cooperated and gave a good account of herself. She was very miserable and tearful. Physical examination revealed a robust physique. The alimentary, respiratory and circulatory systems were clear. The pupils were equal and reacted to light and accommodation. The reflexes were exaggerated.

A married man, aged thirty-two years, a postman, had been admitted on January 6, 1930. He states that he had been quite well until three months previously when one Sunday, while walking along the street, he had suddenly felt giddy; this sensation had rapidly passed off, but next morning he had suffered from another similar attack of giddiness. No vomiting had occurred and he had continued to work. A desire to defecate would follow these attacks and the bowels had actually acted six to seven times a day, one morning four times in the hour before breakfast. On awakening in the morning he had commenced to feel nausea and had actually vomited. He had got to such a state that he would wonder how he would be each day and, when faced with the prospect of work, would vomit and defecate. On Sunday with no work ahead he would feel quite well. He had never suffered pain; the motions were natural; there was no blood or mucus in the stool. Lately he had suffered from epigastric pain and on the morning of admission had vomited "at the thought of coming here." The vomit was "like spittle." He had had to do it to ease himself. He got a "nervous cough" and "that caused vomiting." Usually he felt ill only in the morning, although he had vomited in the evenings and then it was always after food. His eyesight was good, he had no headaches. He had had a spell from work for a week and had felt quite well. He had returned to work and had remained well for two weeks, but the feeling had returned. He had noticed for the last two weeks that he could not stand the confined office and was not comfortable until he started off on his round. He had lately slept outside because he felt he required as much fresh air as possible. He had suffered from excessive desire to open the bowels since boyhood. He remembered it first definitely during an examination when sixteen years of age. Since twenty-one years this had become worse.

On admission he had been an early middle aged man with no psychotic symptoms. He had appeared to be of the hypochondriacal dependent type with a definite fear of ill-health, so that he had magnified and become obsessed with his splanchnic sensations. The physical condition was good. The alimentary and circulatory systems were clear. In the respiratory system there was deficient abrupt expansion with consequent deficient respiratory sounds. Breath sounds were harsh. The pupils were equal and reacted to light and accommodation. The reflexes were normal.

Hysterical Delirium.

A female patient, aged twenty-three years, single, an embroidery designer, had been admitted on January 31, 1930. She had worried herself about a "boy friend" for the past three years and had not worked since Christmas. She said that she had worked too hard and neglected herself and that she thought her brain had gone. Her father was supposed to have been caring for her at their home. She said she was very emotional and wished to die and that she had attempted suicide at the "Gap" to escape her lazy life. She asked if she was losing her voice and imagined that her heart had an abnormal beat. She did not agree with her step-mother, who belittled her before friends, her father did not take her part to any extent when she was treated badly by the step-mother. Business had been slack six weeks previously, so she had lost her position and she had not reapplied for her position, not feeling sufficiently well. She was jealous of a "boy friend" in whom she was also very disappointed. Her step-mother would be pleased to have her out of the house and married. She said that for some time she had had the feeling that her boy friend could read her thoughts, probably because his uncle was an "entertaining magician" who was supposed to be "a man who knew everything."

On admission she had refused to cooperate, had been very labile and anxious; her attention had been poor, she had been restless. She displayed a good deal of hysterical acting and threw her arms about and clung to the medical officers. She strutted about like a mannequin. She had a delusion that there was an abdominal tumour and that her "brain was deprecatting."

Physical examination revealed a tall, frail young adult. Her circulatory, respiratory and alimentary systems were clear. Her pupils were equal, regular and reacted to light and accommodation. The left knee jerk was hyperactive, the plantar reflexes were flexor in type, the abdominal and epigastric reflexes were hyperactive and there was no other abnormality.

Hysterical Dyspnoea.

A female patient, aged twenty-seven years, the wife of a machinist, had two children. Three years previously she had started to have attacks of dyspnoea. The attacks had become more frequent, the patient had been terrified that she would die from asphyxia, she would struggle, gasp or yawn and her breath would come back. For the last few weeks the patient had begun to lose interest in her work, she had had no energy and had become depressed and very tearful. She had had a lot of financial difficulties and domestic discord with her parents, particularly her mother who lived with them.

On admission the patient had been conscious, able to give a good account of herself, anxious and very tearful; she had complained of respiratory attacks. She had been rather engrossed in her symptoms. No abnormal physical condition had been detected. The patient was excessively stout. On admission the patient had had typical attacks of dyspnoea in the office; she had panted and made a great display, her colour had been good. She had complained continually of these attacks, but had never been observed in one; she had become very much brighter and less tearful until her return from week-end leave, when she had been miserable, anxious, with return of dyspnoea. She had remained like this for the next three weeks, but lately had been more cheerful and was taking more interest outside herself.

Alcoholic Confusion.

A female patient, aged forty-six years, the wife of a chauffeur, had been admitted on February 19, 1930. She had always been a bad sleeper, she had been accustomed to taking bromide and was of a nervous disposition. She had been trained as a chemist and was the daughter of a medical man. She had taken "Luminal" lately and wine to excess. A month previously she had become intoxicated with "Luminal." She had neglected her home. Previously scrupulous, she had let everything go. Her husband had spoken to her about the state of her housekeeping affairs and she had become upset and depressed. She had had some idea that there was trouble with the police about a revolver. For two years she had been taking wine. She bought wine with money obtained from pawned plate and cash orders.

On admission she had been conscious, but incapable of giving any account of herself. She answered questions disconnectedly and incompletely. She gave her name, age, address and year. She said that she was in a hospital, but did not know the name of it. She had auditory hallucinations; she spoke incoherently to voices, was restless and had no appetite.

Physical examination revealed a woman of small physique and poorly nourished, with an unpleasant bodily odour. She was edentulous. Her appetite was poor and her bowels constipated. Her pupils were equal and reacted to light and accommodation. The knee jerks were not elicited. The plantar reflexes were flexor.

Cerebral Syphilis.

A female patient, aged forty-four years, gave the history that four months previously she had lost the use of the right hand for a period of two hours. She had had a sensation of numbness and tingling at the same time. About two months previously she had had a similar attack.

She had been in bed for nine weeks and she had progressed favourably until two weeks before admission when her speech became impaired and she experienced difficulty in expressing herself. She had become irritable and argumentative and then her memory had failed and she had become increasingly dull and apathetic; she had been treated in hospital without benefit.

She had been born in Scotland. Her husband had died two years after marriage and the patient had taken up nursing and had travelled about the world. She had married again twenty years before the meeting and had been happy. She had told her husband that she nursed a patient with bad syphilis in Singapore many years before and had developed infected fingers as a result. She had never suffered from headache until a recent illness when she had developed pain in the back of the head. Nine months before she had complained of pain after micturition.

On admission she had been hallucinated, hearing voices continually and she had had delusions of persecution by voices which said she was bad. Her recent memory had been much impaired, she had been totally disorientated. She had been restless and resistive and troublesome with food. Her knee jerks had been exaggerated, but no other abnormalities had been found. The Wassermann test had yielded a reaction.

Since admission she had shown no improvement. She was restless and noisy at times, perplexed and confused. She was agitated and said that she wanted to die. At times she was reticent, dull and silent. She was having a course of "Tryparsamide."

A married man, aged forty-two years, a clerk, had been admitted on February 28, 1930.

Eight years previously while working he had found that his left side had become weak. He said that he was not off duty as a result. The condition had shown a gradual slight improvement. He thought that he was put into hospital under the instructions of some Macquarie Street specialist for a "nerve complaint" of the nature of which he had no knowledge. He felt well. He ate and slept well. He said that he was carrying on his work satisfactorily. He denied that there was anything wrong with him. Apparently he had failed to carry on his duties satisfactorily and had been persuaded to go into hospital in consequence.

On admission he had been dull, disorientated and confused, emotionally inert and unresponsive. He had denied there was anything wrong with him. He had been entirely lacking in insight into his mental condition, listless, apathetic and energetic with poverty of ideation and a considerable degree of dementia.

Physical examination revealed a moderately good physical condition. The alimentary, circulatory and respiratory systems were clear.

There was delayed sensation to pain over the trigeminal distribution. There was deviation of the tongue to the left. Fine fibrillary tremor was present. There was lateral nystagmus both to the right and the left. There was weakness of the facial muscles. Slight double ptosis of the eyelids was present. The pupils were equal and reacted to light and accommodation. There was left facial paresis. Speech was somewhat slurred; there was difficulty with the labials. Sensations of pain, heat and cold were delayed on the left side. The sense of passive position on the left side was lost. Stereognosis was impaired on the left side. There was rigidity on the left side with wasting of the arm and leg muscles. There was paresis of left side of face, left arm and leg and some spasticity. Coordination was impaired on the left side. Equilibration was poor because of hemiplegia. The reflexes were exaggerated. Babinski's reflex was present on the left side (associated with withdrawal movement). Varicose ulcers had been present on the right side.

A male patient, aged eighteen years, had a history that when he was fifteen and a half years of age, he had been seen to be inattentive, forgetful and losing interest. He had become bad tempered and destructive and his speech had been affected. He had had vomiting attacks for twelve months, lasting a week at a time.

On admission he had been elated, euphoric, facile and fatuous. His speech had been slurred and his ideation impaired. The general systems had been clear. The left knee jerk had been exaggerated. There had been no pupillary reaction to light. The Wassermann test had yielded a reaction in both blood and cerebro-spinal fluid. The result of the globulin test had been positive. The cells had numbered twelve and the curve from the gold sol test was 555443221.

He was dull, childish and mildly euphoric. He had had two recent attacks of syphilitic iritis.

A male patient, aged forty-seven years, the father of the previous patient, had contracted syphilis when twenty-five years of age. Two years ago he had been shocked to find that his son was a congenital general paralytic. He had become depressed and had felt weak, he had been unable to sleep. He had had dizzy turns and would fall. His legs had felt weak.

On admission he had been dull, inert, morose. He had had perforating ulcers of the foot. Examination of the nervous system revealed Rombergism, intention tremor and exaggerated knee jerks. Extensive old chorioiditis was present. He complained of cephalgia. He had a girdle sensation and shooting pains in the legs. His gait was unsteady. A slight reaction had occurred to the Wassermann test in the blood and a definite reaction had been obtained in the cerebro-spinal fluid. The globulin test had yielded a positive reaction. The cells had numbered fifteen and the gold sol test curve was 012000000.

Disseminated Sclerosis.

The illness of a female patient, aged thirty-eight years, a clerk, had begun in 1922 with twitching in legs and weakness. She had developed pains in the right arm every evening. She had been unable to walk unsupported. The symptoms had become progressively worse until May, 1924, when she suffered severe head pains. She had remained bright and intelligent and had cooperated well in the examination. On examination the general systems had been clear. The Wassermann test had yielded no reaction and the cerebro-spinal fluid had been normal. Examination of the nervous system had revealed nystagmus on looking to the left. Giddiness had been present and slight difficulty in pronouncing labials. The pupils had been unequal, the right larger than the left. There had been no anaesthesia and no paresis. The knee jerks had been hyperactive and the plantar reflexes flexor in type. No clonus had been present and the pupillary reactions had been normal.

On discharge in July, 1925, she had been able to walk with a stick, but had gradually become weaker and more helpless and her vision had become blurred. On readmission in July, 1929, she had been querulous, complaining and morbidly interested in her condition, thin and weak.

Examination of the nervous system revealed increasing blurring of vision, paralysis of lateral gaze and coarse horizontal nystagmus, slight affection of speech, the patient talking thickly. The sensory system was normal except for hyperesthesia in the mid-line of the back over the fourth, fifth and sixth thoracic vertebrae. There was wasting of the muscles of the extremities and paralysis of the lower limbs. The toes were dorsiflexed and foot drop was present. The reflexes were as before. The cerebellar tests gave normal results.

Since admission the patient had been emotional and rather labile. She complained of severe cephalgia and general weakness. She had had a course of malarial treatment without benefit. She was being given "Tryparsamide." She was at times faulty in her habits.

Puerperal Confusion.

A female patient, aged twenty-six years, married, the wife of a traveller, had been admitted on February 1, 1930. She had been confined six weeks previously and had been quite well before the birth of her child, but had not been well since. She was worried because she imagined her sister thought she was a bad woman and said that she should not be alive because she could not cease worrying.

She imagined that her people thought that she was a consumptive and that they were glad to be rid of her. She was very confused.

On admission she had been conscious, quite incapable of giving a coherent and rational account of her illness and emotionally depressed. She had had delusions of persecution and great difficulty in thinking. She became absorbed in delusional ideas. She was rather unsettled and inclined to be restless, although amenable. The general systems were clear and the physical condition good.

Recurrent Melancholia Associated with the Puerperium.

A woman, aged forty years, had been in Broughton Hall on two previous occasions, suffering from acute melancholia. She had been readmitted on February 11, 1930.

On December 28, 1929, her baby had been born. She had remained in hospital for ten days and had then gone home to Newtown. Shortly afterwards she had begun to become depressed, dull, retarded and unable to carry on her household duties.

On admission she had been acutely depressed and miserable and afraid she was going to die. Her memory and orientation had been unimpaired. She had been silent, inert and unresponsive. She had lain in bed staring in front of her and taking no interest in her surroundings. She had remained reticent, listless and apathetic for three weeks and troublesome with taking food and then had begun to improve.

At the time of demonstration she was of the dull stolid Russian peasant type, was much brighter and was eating well but remained rather disinterested, quiet and seldom spoke.

Puerperal Psychosis.

A married woman, aged twenty-three years, had been admitted on July 27, 1929. She had become strange in her actions during pregnancy and induction had been performed at the eighth month. After the birth of the child she had become restless, resistive and had refused to answer questions. She had been transferred to a private hospital where she had remained until the present time. She had been restless at times and generally happy, but at other times she had been resistive and uncommunicative.

On admission she had been incapable of conversing, her attention had been poor, her perception impaired, her ideation disordered and her memory defective and totally disorientated. She had been very depressed and had had frequent outbursts of weeping. She was restless and resented interference. On examination her teeth were seen to be very bad; her tongue was coated and dry. Her appetite was poor and her bowels costive. Her pupils were equal and reacted sluggishly to light. All the reflexes were exaggerated.

Conversion Hysteria.

A single woman, aged thirty years, had been admitted on August 8, 1927. According to the family history her father and mother were alive. She had one brother and three sisters.

She was the second child. She had been a healthy baby but had had infantile convulsions. While at school from eight to fifteen years of age she had been very bright; her studies had been interrupted by rheumatic fever. She had had several attacks of quinsy, the last attack when she was twenty-one years of age. After the rheumatic fever she had become "hysterical," had lost her eyesight for some months and had been treated at the Royal Prince Alfred Hospital. She had been bed-ridden for two years and had not been able to walk. When this was cured she had become "psychic" and would go into trances. At twenty she had been much improved, but had still had unconscious "turns" when out and would have to be brought home. She had taken a position as a nursery governess for six years. She had been engaged to be married for two years and her fiancé had broken off the engagement.

Her nervous trouble had commenced again two months after the broken engagement. She had lost her memory for a couple of hours. After this she had had recurrent

fainting attacks which were precipitated by any fright or shock.

On admission she had complained of insomnia. She had been childish and had tried to placate everyone. She had been unable to give a connected history of her life.

Physical examination had revealed a normal heart and chest, urine clear and pupils which were equal and reacted to light and accommodation. The knee jerks had been present and she had dragged her left leg when walking.

For the first six months the patient had slept badly and would not cooperate with treatment. She had complained of pain in her side. She had been petulant and had cried easily. At times she had been spoon fed. She had then given up complaining, but had manifested no improvement. After nine months she had become brighter, had helped and had been interested in the ward. She maintained this state but still refused to walk without assistance.

Chronic Litigious Paranoia.

A female patient suffered from litigious paranoia. On admission it had been noted that she was garrulous, talking incessantly, with a delusion, amounting to an obsession, that she owned the house next door. She had threatened the inmates in an irresponsible and aggressive manner and stated, almost incoherently, that she had been persecuted for years. The blood did not react to the Wassermann test.

Physically, nothing of note had been detected on admission, but she had been restless, resistive and had refused food.

Her account of herself was that in June, 1915, she bought Section 3, Lot 25, paying £5 12s. od. to have the land and little cottage transferred to her. J.A.G. and wife had sold it to her. She would not say how much she paid, but said it was enough to satisfy Mrs. G., who "passed the deed to her without prejudice." The patient stated that her deed showed that she bought Lots 24, 25 and 26; that she began to build a house on Lot 26 immediately she bought the land and she had been to a magistrate at Rozelle several times. She said that he told her to go into the house and give the tenants notice to quit—to nail a notice on the door. The tenants, Mr. and Mrs. N., had said that the house was theirs and a Mr. C. claimed the land representing Lot 24.

The magistrate at Rozelle had told her to have a summons taken out at the Glebe Police Court, so the patient had taken the deed with her, but was there told that she must go to the Supreme Court, where she claimed to be well known. Mr. Justice Long-Innes had told her to collect the arrears of rent through a solicitor. The patient stated that she had possessed property all her life and must leave the hospital to collect her rent. She had given her receipts to a solicitor.

There was definite evidence that the land and house in question were not owned by the patient, who had caused much trouble in the neighbourhood because of her idea, firmly fixed, that she owned the house and land next to her residence. She had abused Mr. and Mrs. N. continuously, invading their house in an aggressive manner.

If released, she would continue to give trouble, for she would not give up her idea of ownership and claimed to have paid rates and taxes on the property for years. She talked rapidly and almost incoherently in a high, infantile voice which it was tiring and irritating to hear.

It was said that she had been well until a week before admission, though for three months she had harboured the idea that she owned the house next door, entering and interfering with things there and finally assaulting the woman who lived there. She had been summoned to attend court on this charge, but, refusing, had been arrested, when her condition was found to be such that she was sent to the Reception House and certified as insane.

Toxic Confusion.

A single man, aged fifty-eight years, a labourer, had been admitted on February 5, 1930. He had been drinking to excess for one week (ten glasses of beer during the day and a flask of brandy at night). He had become miserable

and depressed in consequence. He had suffered from *delirium tremens* fifteen years previously, but since then had had only an occasional drink. He was unable to give a coherent account of himself.

On admission he had been confused and incoherent. He had given a rambling and incoherent account of himself. Memory and orientation had been impaired. He had been extremely suggestible; he forgot a thing or name immediately it was mentioned and had made mistakes in identity. He had been restless, foolish and fatuous in demeanour. He took little interest in his surroundings, but was anxious to make friends with other patients.

Physical examination revealed a poor physical condition. He was edentulous. His systolic blood pressure was 114 and his diastolic pressure 86 millimetres of mercury. His pulse rate was 72 in the minute. His heart sounds lacked tone and were distant. His blood vessels were sclerotic and the wall palpable. The breath sounds were vesicular. A few scattered rhonchi were present. There was a fine tremor of the tongue; the pupils were equal and reacted to light and accommodation. The gait was unsteady. He walked with a wide base and had a tendency to reel. Rombergism was present. The reflexes were exaggerated.

Traumatic Neurosis.

A male patient, aged fifty-nine years, a labourer, a married man, had been admitted on February 3, 1930.

On December 16, 1929, he had been working on a blast furnace when a number of bricks fell down. One had struck him on the head, two others striking him on the shoulder and leg. He had been stunned and had no clear recollection of what happened subsequently. He had been in hospital for two weeks. Since the accident he had suffered from severe headaches continually, the pain being very intense at times. He was unable to sleep as a result; usually he only dozed for a few minutes, three hours being the longest period he had slept at any one time. His hearing had been impaired since the accident, the right side was more affected than the left. He also suffered from head noises which sounded like crickets singing. Nothing seemed to give relief. He had developed a sensation of nausea without vomiting and of vertigo on slight exertion. At times the pain extended to the occipital and cervical regions but was of short duration there. The head pains were worse round the scar of the injury and extended over the parietal and temporal regions on the right side. On pressure of the right temporal region the pain radiated over the vertex and extended to the opposite side. X ray examination at the time of injury had revealed a fractured skull. He denied venereal disease; alcohol and tobacco consumption was moderate.

On admission he had been quiet, rather dull, indifferent to his environment, engrossed with his own troubles, hypochondriacal and evidently anxious to make the most of his accident. He was mildly depressed but did not appear to worry about the future. He said that he would like to be back at work, but was unconvincing.

Physical examination revealed a moderately good physical condition. He was well nourished and had a triradiate scar on the right parietal bone. The teeth were bad, but otherwise the alimentary system was clear. Nothing abnormal was detected in the circulatory system. The chest was emphysematous, but otherwise the respiratory system was clear. Fins was present in the urine. The tongue had a fine fibillary tremor, particularly at the tip and border. There was hyperesthesia of the right temporal region.

All reflexes on the right side were exaggerated. The supinator and biceps jerks were marked, also on the left side eliciting them caused discomfort. The general motor functions were good.

Post-Operative Confusion.

A male patient, aged fifty-seven years, a fettler, gave the history that five weeks prior to admission he had been operated on for gall stones. He had gradually become more depressed and retarded and out of touch with his environment. He had refused food and seldom spoke. He had become very confused.

On admission he had been confused, inaccessible and unable to give any account of himself. He was resistive, dull and disinterested. He had developed several boils and had then shown a gradual improvement, but still remained listless, apathetic and confused. At times he was faulty.

Physical examination revealed normal general systems. The abdominal reflexes were exaggerated. The knee jerks were not elicited.

Cerebral Arteriosclerosis.

A married man, a miner, aged forty-six years, gave a history that for eight months he had suffered from "nerves." He was lying quietly in bed when he had become conscious of his heart's action; it had become rapid and forcible. He had been under treatment for neurasthenia for three months. He had then developed a "drawn up" feeling in his stomach; this made him feel uncomfortable, but had not interfered with his appetite and he had experienced no discomfort on taking foods. He had also suffered from dyspnoea and became breathless on the slightest exertion. He had suffered from dyspnoea once for three months when he was doing stone masonry, but had had no further attack until recently.

He had a "nervy" feeling in his head, was restless and unable to be still. He could not sleep but ate well. When he walked he felt as though "all his breath was taken away from him" although there was no tachypnoea associated with it. At times he imagined that his eyes were "sticking." He suffered frequently from severe headaches; he had no giddiness. He had previously had hot flushes in the neck and his eyes had felt swollen and the cornea had become infected. He had had a throbbing sensation in the head like a drum being beaten and could obtain no relief from this. These sensations were not so severe at the time of the meeting.

The patient was cheerful, garrulous and anxious to explain all his symptoms. He gave a reasonable account of himself. He showed a mild degree of acceleration of ideation to psychotic symptoms.

Physical examination showed that the general systems were clear. Occasional head pains were pronounced. Reflexes were exaggerated.

Combined Degeneration.

A male patient, aged forty-four years, a salesman, had been well until six years previously in America. It had been extremely cold and on going out of the steam heated house into the cold, he had experienced in the knees pains of a sharp and shooting nature. Warmth had relieved them. Pains had then developed in his left shoulder and he had felt as if a worm were in his left arm. The symptoms had gradually become worse and his eyesight affected. Two and a half years previously he had begun to stumble and his ankles had seemed to give way and he had then developed cramps in his foot. Two years previously he had experienced severe pains between his shoulder blades when sitting down with his back supported. The pains in his back had become very severe. He had sought medical advice on several occasions and had become firmly convinced that he had a worm in his shoulder. Last April he had been forced to give up work and had gone to the Alfred Hospital in Melbourne where three unsuccessful attempts had been made to inoculate him with malaria.

On admission he had complained that his legs would not support him and that he had a tendency to fall, but in no particular direction. He had not been able to walk in the dark. The pupils had been equal and had reacted. Sensation had been delayed with patchy areas of anaesthesia on both legs. Hyperesthesia to heat had been present below the left clavicular region. On the soles of the feet thermal sensation had been delayed, then excessive to heat and diminished to cold. Gait had been ataxic, stamping with the heels. He had walked on a wide base. He had swayed backwards and forwards. Knee jerks had been exaggerated considerably on both sides. A double Babinski reflex had been present and an ankle clonus on both sides. No reaction had occurred to the Wassermann test and the cerebro-spinal fluid was normal.

He had been given a course of "Novarsenobillon," the doses being increased to 0.9 grammes. He had said that he felt better, but had complained of a "gritty" feeling in the palm of the left hand. He had walked a considerable distance without the use of a stick, although his gait was still spastic. During treatment he had been optimistic and cheerful and had claimed benefit from each injection. He had been inoculated with malaria again.

At the time of the meeting his gait was spastic, he walked on a wide base, he complained of pain. He had had twelve malarial rigors and claimed benefit from this. His physical condition was unchanged. He remained cheerful and hopeful in spite of it.

Huntington's Chorea.

A male patient, aged forty-two years, gave the history that his mother had had chorea all her life. The patient had made a suicidal attempt at Lidcombe and had been sent to the mental hospital at Gladesville.

On admission choreiform movements had been present in the extremities, tongue and head; they had been coarse and jerking in character and lessened by purposive movements. Speech had been explosive. The pupils had been unequal and the reaction to light sluggish. The knee jerks were greatly exaggerated. The Wassermann test gave a positive reaction.

The patient was depressed, sullen and unreliable. He had had ten injections of "Muthanol." Movements were less jerky.

Epilepsy and Early Huntington's Chorea.

A male patient, aged forty-eight years, had been subject to fits for seven years. He had had about four a month. He had noticed himself shaking and trembling for some years, but it had interfered with his activities only of late. He had been depressed and had threatened suicide prior to admission. His son, aged fourteen, had developed similar tremors.

On admission the patient had been restless and confused, menacing and threatening without cause. Choreiform movements had been present affecting the arms, hands and tongue. Speech was semi-explosive and thick. The knee jerks were exaggerated. The other systems were clear.

Toxic Psychosis, Due to Neisserian Infection.

A married man, aged fifty years, born in Scotland and having two children, had been admitted to a mental hospital on January 28, 1930, having been certified as insane at the Reception House on the same day. Dr. Ross had found him very noisy, with crying and roaring as an interlude, while Dr. Mallam had noted that he was restless and noisy, replying to questions with abuse.

His father was stated to have been strictly religious, a teetotaller and non-smoker. The patient had had a healthy youth until affected by small pox at twenty years of age. He had worked in a factory until marriage at twenty-nine years of age. Both children were healthy girls. He had come to Australia in 1913, but had not done very well. The outbreak of war had found him thinking of returning home, but instead he had enlisted early in 1915, contracting severe dysentery on the Peninsula, being evacuated to England and finally discharged there in June, 1916. He was then supposed to have chronic arthritis, but had worked for short spells after discharge, though subject to "bad turns" (trouble with knees); at length he had been given a 50% pension.

Returning to Australia in 1920, he had worked spasmodically selling vegetables until 1928. He had gone into Randwick Hospital in October, 1929, having, for twelve months, noticed that he was "losing weight and getting weaker" and having "trouble with his joints." There he had exhibited mental symptoms and on admission to the mental hospital, he had appeared somewhat dull and very mildly confused, yet quiet.

He was a shallow, poorly nourished man, who complained of "arthritis," moving his joints very unwillingly in the apprehension of pain. He had a urethral discharge, which contained gonococci. He admitted gonorrhoeal

infection more than twenty years ago, adding that he had lately been catheterized. This discharge had cleared up by the middle of February. He had had talkative spells, chiefly of the religious nature and usually at night. He admitted that at night he "preached" and imitated clergymen, saying that he could not help it. He had become quiet and had given a good account of himself, yet had remained somewhat childish and apparently disorientated. He had remained about the same, at times quiet and moderately rational, at others, mildly excited, restless and "preaching." On March 19, 1930, he had been allowed to leave the hospital on leave at the request of his wife.

Transient Alcoholic Amnesia.

A single man, aged thirty-six years, a barber, born in England, had been admitted to the mental hospital from the Reception House, whither he had been taken by the police after arrest for refusing to pay his tram fare and using insulting words. After arrest he had refused to speak or give any information about himself, tacitly accepting the name of "Jimmy Jones" which the police had suggested to him and being definitely amnesic.

He had been examined by Dr. Ross and Dr. Mallam on February 7, 1930, but owing to his refusal to reply to any questions, the certificates were meagre.

On admission to hospital, also on February 7, his condition had been diagnosed as "melancholia, delusional" and he had again been examined on February 28 by Dr. North and Dr. Bond. Dr. North had noted grandiose delusions and a sense of persecution, with a rambling and illogical manner. Dr. Bond had found him at times suspicious and aggressive, with defective memory and periods of depression. After three days in the hospital during which he remained amnesic his true name had been elicited, with a history of pneumonia four years before, gonorrhoeal orchitis fourteen years before and a statement that he had also suffered from shell shock.

He had been fully conscious on admission and, physically, had proved to have very bad teeth, furred tongue and sluggish knee jerks.

Under examination he had spoken fairly freely, but had refused to give any personal history. He admitted that his name was not Jimmy Jones, but would not then give his real one, his age, social condition *et cetera*. He had claimed to be well educated and probably better read than anyone in the institution. He had said that he was silent before the police because Christ was silent when on trial. He had harped on the great wickedness of the world and had suddenly refused to say any more and had left the room.

He later had admitted to heavy alcohol consumption and heroin habits, sleep-walking and night terrors. At school he had been a good scholar from eight to fourteen years and he had stated that he attained the seventh class.

He thought that he was persecuted by the police and by society and said that a man should obey the law only if his conscience so directed and that he would again refuse to pay his tram fare as that was his mind.

An additional physical detail was an account of enuresis up to thirteen years of age.

Proceedings of the Australian Medical Boards.

NEW SOUTH WALES.

THE undermentioned have been registered under the provisions of the *Medical Act, 1912 and 1915*, of New South Wales, as duly qualified medical practitioners:

Green, William Herbert, M.R.C.S. (England), 1926, L.R.C.P. (London), 1926, Rothsay, Lower Wycombe Road, Neutral Bay.

Klug, Cecil Conrad, M.B., B.S., 1928 (Univ. Melbourne), Prince of Wales Hospital, Randwick.

Mills, Eleanor Lalla Alice Hillingdon, M.B., B.S., 1923 (Univ. Melbourne), 158, Smith Street, Summer Hill.

Woolcock, Rosslyn James, M.B., B.S., 1927 (Univ. Adelaide), Broken Hill.

Zacharin, David, M.B., B.S., 1926 (Univ. Melbourne), 8, Glover Street, Mosman.

For additional registration:

Jones, Reginald Stuart, F.R.C.S. (Edinburgh), 1929.

Obituary.

AUSTIN QUIRK HENDERSON.

We regret to announce the death of Dr. Austin Quirk Henderson which occurred at East Malvern, Victoria, on May 5, 1930.

Books Received.

MONOGRAPHS ON BIOCHEMISTRY: BACTERIAL METABOLISM, by Marjory Stephenson, M.A.; 1930. London: Longmans, Green and Company Limited. Royal 8vo., pp. 331, with diagrams. Price: 18s. net.

DIATHERMY IN GENERAL PRACTICE, by Eric Payten Dark, M.C., M.B., Ch.M.; 1930. Sydney: Angus and Robertson. Demy 8vo., pp. 165, with illustrations. Price: 25s. net.

MINOR MONOGRAPH SERIES: HABITUAL CONSTIPATION AND ITS TREATMENT. AN ACCOUNT OF A NEW THERAPEUTIC METHOD, by M. H. Burnier, M.D., M.R.C.S., L.R.C.P.; 1929. London: Baillière, Tindall and Cox; Sydney: Angus and Robertson. Crown 8vo., pp. 71, with illustrations. Price: 4s. 6d. net.

MINOR MONOGRAPH SERIES: SLEEP AND THE TREATMENT OF ITS DISORDERS, by R. D. Gillespie, M.D., M.R.C.P., D.P.M.; 1929. London: Baillière, Tindall and Cox; Sydney: Angus and Robertson. Crown 8vo., pp. 267. Price: 9s. 6d. net.

IMMUNITY IN INFECTIOUS DISEASES: A SERIES OF STUDIES, by A. Besredka; 1930. London: Baillière, Tindall and Cox. Demy 8vo., pp. 370. Price: 18s. net.

INDIVIDUAL PSYCHOLOGY, by Erwin Wexberg, M.D.; 1930. London: George Allen and Unwin Limited. Demy 8vo., pp. 448. Price: 15s. net.

Diary for the Month.

MAY 20.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

MAY 23.—Queensland Branch, B.M.A.: Council.

MAY 27.—New South Wales Branch, B.M.A.: Medical Politics Committee.

MAY 28.—Victorian Branch, B.M.A.: Council.

MAY 29.—New South Wales Branch, B.M.A.: Branch.

MAY 29.—South Australian Branch, B.M.A.: Branch.

JUNE 3.—New South Wales Branch, B.M.A.: Organization and Science Committee.

JUNE 3.—New South Wales Branch, B.M.A.: Post-Graduate Work Committee.

JUNE 4.—Victorian Branch, B.M.A.: Branch.

JUNE 5.—South Australian Branch, B.M.A.: Council.

JUNE 10.—New South Wales Branch, B.M.A.: Ethics Committee.

JUNE 12.—Victorian Branch, B.M.A.: Council.

JUNE 12.—New South Wales Branch, B.M.A.: Clinical Meeting.

JUNE 13.—Queensland Branch, B.M.A.: Council.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xviii.

SAINT VINCENT'S HOSPITAL, SYDNEY, NEW SOUTH WALES: Honorary Vacancies.

ST. GEORGE DISTRICT HOSPITAL, KOGARAH, NEW SOUTH WALES: Senior Resident Medical Officer, Junior Resident Medical Officer.

SYDNEY HOSPITAL, SYDNEY, NEW SOUTH WALES: Honorary Clinical Assistant.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.I.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 21, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company, Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Mount Isa Hospital.
SOUTH AUSTRALIAN: Honorary Secretary, 207, North Terrace, Adelaide.	All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Medical practitioners are requested not to apply for appointments to positions at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

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